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Atmospheric Attenuation Model, 1964, in the Ultraviolet, Visible, and Infrared Regions for Altitudes to 50 km

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Abstract

A model of a clear standard atmosphere, for determining attenuation in the ultraviolet, the visible, and the infrared windows, is derived. The derivation is based on a Rayleigh atmosphere combined with aerosol and ozone components. The format of the model is a series of tabulations for 22 wavelengths with Rayleigh, aerosol, and ozone components arrayed at kilometer intervals to an altitude of 50 kilometers. Exploratory calculations pertaining to horizontal, vertical, and slant-path transmisson from sea level, transmission between two altitudes and transmission to space are readily made from the tabulations. Because of its more extensive coverage and improved computational programming, this report, including the tabulations, fully replaces the earlier publication, "A Model of a Clear Standard Atmosphere for Attenuation in the Visible Region and Infrared Windows," by this author.

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Symbols

A_v	Vigroux ozone absorption coefficient (cm^{-1})
D_3	Ozone concentration (cm/km)
d	Horizontal path length (km)
h	Altitude (km)
N_p	Aerosol number density (cm^{-3})
N_r	Molecular number density (cm^{-3})
T_h	Horizontal transmission
T_{0-h}	Transmission between sea level and altitude h
$T_{h-\infty}$	Transmission between altitude h and space
$T_{\Delta h}$	Transmission between two altitudes above sea level
β_3	Atmospheric ozone absorption coefficient (km^{-1})
β_p	Aerosol attenuation coefficient (km^{-1})
β_r	Rayleigh attenuation coefficient (km^{-1})
$\bar{\beta}_r$	Mean Rayleigh attenuation coefficient (km^{-1}) for $\Delta h = 1$ km
β_{ext}	Extinction coefficient (km^{-1})
$\bar{\beta}_{ext}$	Mean extinction coefficient for $\Delta h = 1$ km
σ_r	Rayleigh scattering cross section (cm^2)
τ_r	Rayleigh optical thickness from sea level to altitude h, (0-h)
τ'_r	Rayleigh optical thickness from altitude h to space, ($h-\infty$)
τ_{ext}	Extinction optical thickness (molecular + ozone + aerosol) from sea level to altitude h, (0-h)
τ'_{ext}	Extinction optical thickness (molecular + ozone + aerosol) from altitude h to infinity ($h-\infty$)

Atmospheric Attenuation Model, 1964, in the Ultraviolet, Visible, and Infrared Regions for Altitudes to 50 km

I. INTRODUCTION

In this paper, a "standard atmosphere" is distinguished from a "clear standard atmosphere"[1] in that the latter is characterized by aerosol and ozone attenuating components in addition to the molecular or Rayleigh component. A model of a clear standard atmosphere for determining absorption and attenuation in the ultraviolet, the visible, and the infrared windows is useful for interpreting the optical properties of the atmosphere and can function like the U.S. Standard Atmosphere, as an information source for carrying out various exploratory calculations. The derived tabulations at the end of this report are based on the following:

a. The Rayleigh attenuation components are determined by utilizing Rayleigh scattering cross sections with molecular number densities from the U.S. Standard Atmosphere.

b. The aerosol attenuation components are established from available transmission measurements in conjunction with a suitable vertical aerosol density distribution.

c. The ozone absorption components result from Vigroux's coefficients applied to a generalized vertical ozone distribution.

This approach describes the atmosphere vertically in terms of Rayleigh and aerosol attenuation coefficients, atmospheric ozone absorption coefficients as well optical thickness values.

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The model concept is readily workable for a molecular atmosphere and has been computed by Deirmendjian.[2] Sekera computed a family of curves showing the variation of the optical thickness of the molecular atmosphere with height and with wavelength.[3] Extending this concept to include an aerosol component and an ozone component is more difficult primarily because it must be compatible with considerable variation of atmospheric properties. The model concept for both sea level and with altitude has been examined previously by Deirmendjian for several atmospheres containing different computed aerosol size distributions[4] and by Volz and Goody in conjunction with their illumination profiles of twilight intensity.[5]

Fundamental to the establishment of this model is a definition of "clear standard atmosphere" which is adequately representative and which lends itself to quantitative treatment. Toward this end, reference is made to the long path transmission measurements of Yates and Taylor,[6] Dunkelman and Baum,[7,8] and Curcio, Knestrick, Cosden, and Durbin.[9,10,11] In these instances experimental data were obtained showing relationships between wavelength and attenuation coefficients for various meteorological ranges at sea level.

The International Visibility Code[12] designates a clear day as one with a daylight visual range having an upper limit of 20 km and a corresponding attenuation coefficient of 0.2 km^{-1} at 0.52 microns. Accordingly, it is reasonable to define a "clear standard atmosphere" as the latest published standard atmosphere augmented by an aerosol component yielding a resultant meteorological range of about 25 km at sea level. The aerosol size distribution is considered to be unchanged with altitude.[13] Ordinarily, the meteorological range is related to visual background contrast at 0.55 microns. In this definition of a clear standard atmosphere the meteorological range is also associated with the other wavelengths.

Although the development of this model requires the addition of a haze component to a Rayleigh atmosphere, the designation "clear standard atmosphere" is preferred to "hazy standard atmosphere" for the reason that the haze component that characterizes a meteorological range of 25 kilometers would empirically be associated with clear conditions. Thus, use of "hazy" in identifying this model can result in misinterpretation.

2. RAYLEIGH PARAMETERS

Because they are widely used, three Rayleigh parameters are derived for each wavelength: attenuation coefficients as a function of altitude, optical thickness from sea level to a desired altitude, and optical thickness from a desired altitude to space. The Rayleigh cross section is expressed by

$$\sigma_r = \frac{8\pi^3(n_s^2 - 1)^2}{3\lambda^4 N_s^2} \cdot \frac{6 + 3\delta}{6 - 7\delta} \quad (1)$$

where

σ_r is the Rayleigh scattering cross section (cm^2),

λ is the wavelength (cm),

n_s is the index of refraction of air at 15°C and 1013 mb pressure,

N_s is the molecular number density at sea level for a standard atmosphere (cm^{-3}).

and

δ is the depolarization factor.

The term $(6 + 3\delta)/(6 - 7\delta)$ accounts for the degree of depolarization attributable to the anisotropy of the medium. The depolarization factor has been determined by calculation and by laboratory measurement. The latest work of Gucker and Basu[14] yields $\delta = .035$. The values of σ_r as expressed by Eq.(1) were calculated by Penndorf[15] for wavelengths from 0.20 to 20.0 microns. For wavelengths concerned with this report, the values of σ_r are listed in Table 1. The use of Eq.(1) excludes several customary simplifications thus eliminating up to 10 percent error.

2.1 Rayleigh Attenuation Coefficients

The Rayleigh attenuation coefficient at each wavelength is expressed by

$$\beta_r(h) = \sigma_r \cdot N_r(h) \cdot 10^5 \quad (2)$$

where

β_r is the Rayleigh attenuation coefficient (km^{-1}),

σ_r is the Rayleigh scattering cross section (cm^2),

and

N_r is the molecular number density (cm^{-3}).

The values of $N_r(h)$ needed for Eq.(2) were obtained from the U.S. Standard Atmosphere, 1962.[16] This expression is used to compute an array of Rayleigh attenuation coefficients as a function of altitude for each wavelength.

2.2 Rayleigh Optical Thickness from Sea Level to Altitude h

With the Rayleigh attenuation coefficients determined, then for each wavelength

$$\tau_r(h) = \sum_{o}^{h} \bar{\beta}_r(h) \cdot \Delta h \quad (3)$$

TABLE 1. Rayleigh cross sections, $\sigma_r(\lambda)$ and Vigroux ozone absorption coefficients, $A_V(\lambda)$

λ (microns)	σ_r (cm^2)	A_v(cm^{-1})
0.27	8.959×10^{-26}	2.10×10^2
0.28	7.645	1.06×10^2
0.30	5.676	1.01×10^2
0.32	4.309	8.98×10^{-1}
0.34	3.334	6.40×10^{-2}
0.36	2.622	1.80×10^{-3}
0.38	2.091	0
0.40	1.689	0
0.45	1.038	3.50×10^{-3}
0.50	6.735×10^{-27}	3.45×10^{-2}
0.55	4.563	9.20×10^{-2}
0.60	3.202	1.32×10^{-1}
0.65	2.313	6.20×10^{-2}
0.70	1.713	2.30×10^{-2}
0.80	9.989×10^{-28}	1.00×10^{-2}
0.90	6.212	0
1.06	3.320	0
1.26	1.600	0
1.67	5.210×10^{-29}	0
2.17	1.800	0
3.50	2.681×10^{-30}	0
4.00	1.571	0

where

$\bar{\beta}_r$ is the mean Rayleigh attenuation coefficient (km^{-1}) for each altitude increment, and

Δh is the altitude increment, chosen as one km for these calculations.

2.3 Rayleigh Optical Thickness from Altitude h to Space

The relationship, for each wavelength considered, is

$$\tau_r'(h) = \tau_r(\infty) - \tau_r(h) \tag{4}$$

where $\tau_r(\infty)$ is the Rayleigh optical thickness from sea level to infinity. The term $\tau_r(\infty)$ was obtained by using Eq. (3) with the limits set between 0 and 80 km. Above 80 km, $\int_{80}^{\infty} \bar{\beta}_r dh$ can be neglected.

3. ABSORPTION BY ATMOSPHERIC OZONE

In the studies of ultraviolet, visible, and infrared transmission of the atmosphere, the concept of a representative ozone distribution as a function of altitude, based on many observations, is necessary for carrying out exploratory calculations. This need was met somewhat formally with the publication of the 1957 edition of the Handbook of Geophysics[17] which contained eight ozone profiles. These were in considerable use at least by meteorologists, and the material was reproduced unchanged in a later edition. In 1961 an ozone distribution was proposed by Altshuler[18] which was characterized by 0.229 cm N.T.P. total ozone and a maximum concentration at 23 km. This has been designated as a "standard" distribution by Hubbard,[19] by Green,[20] and by others either directly, or indirectly through the references mentioned.

Ozone data acquired since Altshuler's publication show that a representative ozone profile differs substantially from the designated "standard". The Handbook of Geophysics and Space Environment[21] scheduled for publication in 1964 will provide mean values of ozone distribution based on a network of 12 ozonesonde stations in North America. It is emphasized that an exploratory calculation will be better if a profile that is related to latitude and season is used. If only one profile is to be used it should be one representing 0.35 cm total ozone since the work of London, Ooyama, and Prabhakara[22] shows that for mid-latitudes the 0.35 cm value is the annual mean. The profile shown in Figure 1 is based on the material to be published in the Handbook. Furthermore, the profile has been extended upward by utilizing values at 40 km and 50 km derived from chemical equilibrium theory. Values of ozone concentration between these altitudes were derived by interpolation (using semilog paper). This profile provides the ozone concentrations, $\dot{D}_3(h)$, listed in Table 2.

The parameter for determining absorption of the ultraviolet as a function of altitude is the atmospheric ozone absorption coefficient expressed by

$$\beta_3(h) = A_v \cdot \dot{D}_3(h) \tag{5}$$

where

β_3 is the atmospheric ozone absorption coefficient (km^{-1}),
A_v is the Vigroux ozone absorption coefficient (cm^{-1}),

and

$\dot{D}_3(h)$ is the ozone equivalent thickness or concentration (cm/km).

Thus the Vigroux coefficients[23] (Table 1) in conjunction with the 1964 profile permit the computation of an array of atmospheric ozone absorption coefficients to 50 km for each of the desired wavelengths.

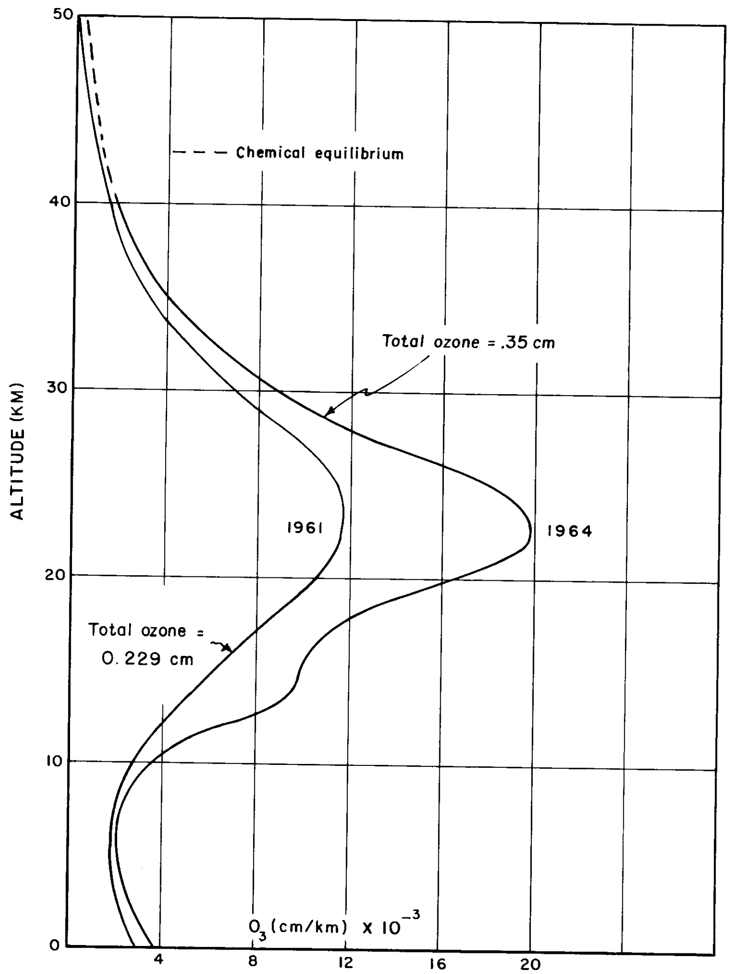

Figure 1. Representative Ozone Concentration Profiles

4. AEROSOL ATTENUATION

As with Rayleigh attenuation and ozone absorption, the fundamental parameter to be used is the aerosol attenuation coefficient. Junge's findings[13] that the aerosol size distribution tends to be unchanged with altitude permits the relationship

$$\beta_p(h) = \beta_p(0) \cdot \frac{N_p(h)}{N_p(0)} \tag{6}$$

$\beta_p(0)$ is the aerosol attenuation coefficient at sea level for a meteorological range of 25 km (km^{-1})

$N_p(h)$ is the aerosol number density as a function of altitude (cm^{-3})

$N_p(0)$ is the aerosol number density at sea level for a meteorological range of 25 km (cm^{-3})

To determine values for $\beta_p(h)$, three kinds of information are necessary as designated by the right hand side of Eq. (6). Each of these now will be considered.

TABLE 2. Ozone concentrations (D_3) from representative profile

h (km)	D_3 (cm/km)	h (km)	D_3 (cm/km)
0	3.56×10^{-3}	26	16.3×10^{-3}
1	3.26	27	14.1
2	2.93	28	12.3
3	2.50	29	10.7
4	2.26	30	9.03
5	2.21	31	7.93
6	2.16	32	6.82
7	2.23	33	5.82
8	2.28	34	4.85
9	2.81	35	4.31
10	3.50	36	3.61
11	4.60	37	3.02
12	6.21	38	2.53
13	8.45	39	2.17
14	9.57	40	1.94 1.86 $\times 10^{-3}$
15	9.94	41	1.49 1.52
16	10.3	42	1.26 1.19
17	11.1	43	1.14 9.30 $\times 10^{-4}$
18	12.2	44	1.04 7.44
19	14.2	45	.919 5.76
20	16.4	46	.858 4.46
21	18.4	47	.798 3.53
22	19.7	48	.747 2.79
23	19.8	49	.695 2.23
24	19.3	50	.647 1.86
25	18.0		

4.1 Aerosol Attenuation Coefficients at Sea Level

Aerosol attenuation is determined by aerosol density which in turn determines meteorological range. The relationship between the aerosol attenuation coefficient and the meteorological range, although established in the visible region, is applicable to the other wavelengths when the measurements are performed over a wider spectral region.

In the ultraviolet, Dunkelman and Baum[7,8] carried out transmission measurements at sea level that yielded extinction coefficients between wavelengths 0.297 and 0.578 microns for various meteorological ranges. The term extinction is used since the coefficients represent the total attenuation at sea level as expressed by

$$\beta_{ext}(0) = \beta_r(0) + \beta_3(0) + \beta_p(0) \tag{7}$$

where

$\beta_{ext(0)}$ is the extinction coefficient (km^{-1}),
$\beta_r(0)$ is the Rayleigh attenuation coefficient (km^{-1}),
$\beta_3(0)$ is the atmospheric ozone absorption coefficient (km^{-1}),

and

$\beta_p(0)$ is the aerosol attenuation coefficient (km^{-1}).

Of particular interest are the results of Dunkelman and Baum for the period February to April 1950 which include measurements at the same location and for approximately the same visual range as Curcio, et al.[9] The ultraviolet results are presented in curve (1) of Figure 2. The presence of strong atmospheric ozone absorption is indicated by the sharp rise of the extinction coefficients at wavelengths shorter than 0.32 microns. In order to determine the aerosol component, β_p of curve (1), the other components as expressed by Eq.(7) must be known. The Rayleigh component was determined by calculating values of β_r for sea level using Eq.(2) with $h = 0$. These values were then subtracted from curve (1) yielding curve (2). The β_3 component is expressed by Eq.(5) with $h = 0$. The surface ozone concentration $D_3(0)$ intrinsic to curve (2) can be determined by trial. For example, assuming a sea-level ozone concentration of 2.5×10^{-3} cm/km yields a series of atmospheric ozone coefficients, which when subtracted from curve (2), yield curve (4). Obviously, the O_3 concentration chosen is too high since the curve is strongly depressed. Further trials show a surface O_3 concentration of 1.8×10^{-3} cm/km approximates the proper value since it yields curve (3) where the trend of the curve is maintained at the shorter wavelengths. Curve (3) now can be extrapolated from 0.297 to 0.270 microns as shown. Accordingly, these values represent the aerosol attenuation coefficients at sea level $\beta_p(0)$ for a meteorological range

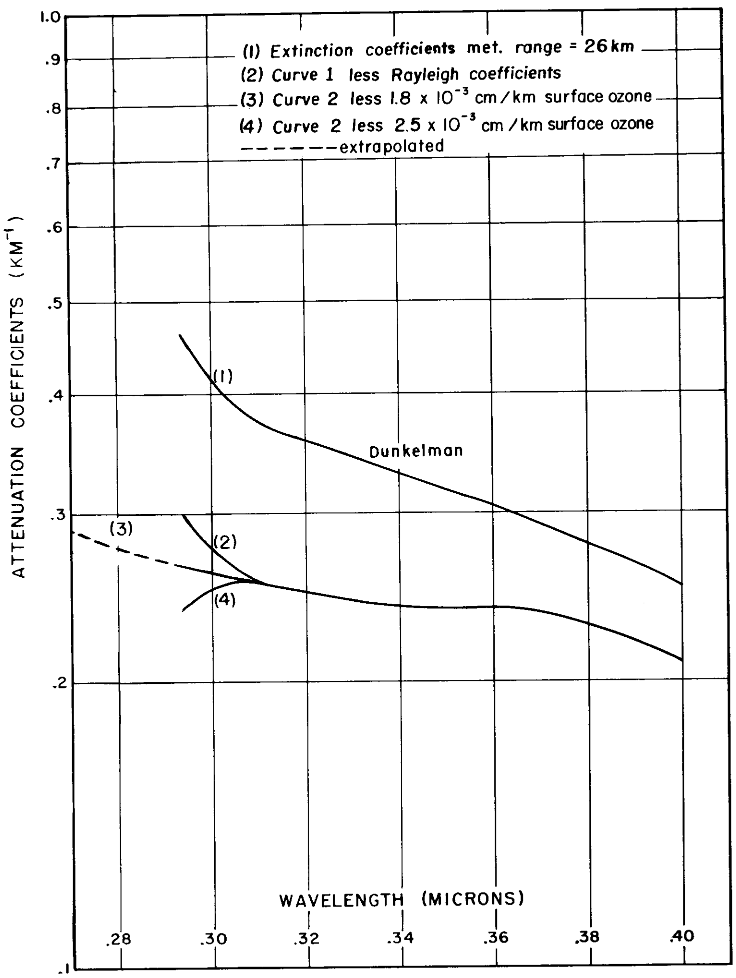

Figure 2. Derivation of Aerosol Attenuation Coefficients in the Ultraviolet for a Meteorological Range of 26 km

of approximately 25 km. The derived surface ozone concentration of 1.8×10^{-3} cm/km is entirely reasonable and supports the short extrapolation.

In the visible and infrared windows, the measurements of Curcio, Knestrick and Cosden[9] are sufficiently extensive so that they are able to present a series of aerosol attenuation coefficients, representative of a clear day with a meteorological range of 25 km, and which can be characterized by a continental aerosol with a particle concentration of about 200 per cc. This information is based on data acquired in the Chesapeake Bay area during the period April 1959 to January 1960. The aerosol attenuation derived from Reference 7, 8 combined with those contained in Reference 9 meet the requirements for values of $\beta_p(0)$ in Eq.(6). These coefficients as well as the Rayleigh attenuation coefficients for the wavelengths of interest are listed in Table 3.

TABLE 3. Rayleigh and aerosol attenuation coefficients at sea level for a meteorological range approximating 25 km

λ	$\beta_r(0)$	$\beta_p(0)$
0.27	2.282×10^{-1}	0.29
0.28	1.948	0.27
0.30	1.446	0.26
0.32	1.098	0.25
0.34	8.494×10^{-2}	0.24
0.36	6.680	0.24
0.38	5.327	0.23
0.40	4.303	0.20
0.45	2.644	0.180
0.50	1.716	0.167
0.55	1.162	0.158
0.60	8.157×10^{-3}	0.150
0.65	5.893	0.142
0.70	4.364	0.135
0.80	2.545	0.127
0.90	1.583	0.120
1.06	8.458×10^{-4}	0.113
1.26	4.076	0.108
1.67	1.327	0.098
2.17	4.586×10^{-5}	0.085
3.50	6.830×10^{-6}	0.070
4.00	4.002	0.063

λ is the wavelength (microns)

β_r is the Rayleigh attenuation coefficient (km^{-1})

β_p is the aerosol attenuation coefficient (km^{-1})

4.2 Aerosol Density at Sea Level

The measurements of Curcio et al.[9] and Dunkelman and Baum[7,8] were conducted at the same location and for approximately the same meteorological range, 25 km. An evaluation of the compatibility of the results of both investigations can be made by plotting β_p vs λ as shown in Figure 3. It is evident that the results are sufficiently compatible because of the character of the overall distribution. Since both field programs functioned at the same location and with very nearly the same meteorological range and since the results are sufficiently compatible, the aerosol number density at sea level for both sets of measurements is considered approximately equal. The aerosol number density at sea level $N_p(0)$ calculated by Curcio et al. approximates 200 cm^{-3}, which will be the value assigned to $N_p(0)$ in Eq.(6).

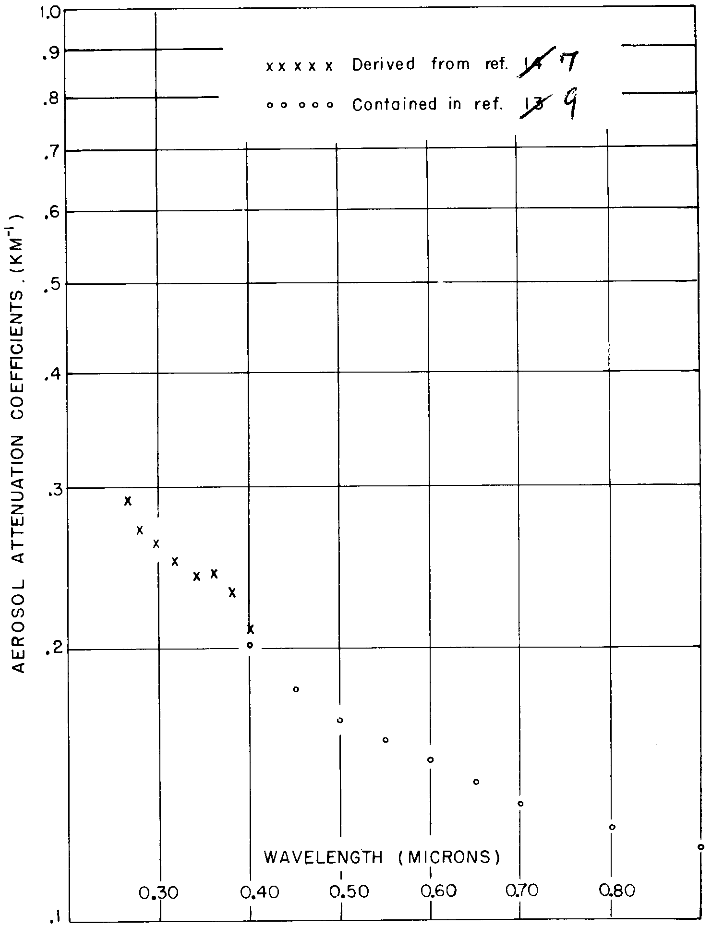

Figure 3. Aerosol Attenuation Coefficients at Sea Level

4.3 Aerosol Density as a Function of Altitude

Previously,[1] an aerosol number density distribution as a function of altitude, $N_p(h)$, was developed based on sea-level and altitude measurements. Briefly, field measurements of aerosol density variation with altitude, conducted between 1945 and 1952 and summarized by Penndorf[24] were used. This analysis shows aerosol number densities as having a scale height of 1.2 km to an altitude of 5 km. Balloon measurements of Chagnon and Junge[25] provide additional information concerning the vertical distribution of aerosols between 10 and 28 km. This information leads to the overall aerosol number density distribution shown in Figure 4. The distribution is used to provide the values for $N_p(h)$ at one kilometer intervals listed in Table 4 and used in Eq. (6).

The requirements for the right-hand side of Eq. (6) now are satisfied and an array of aerosol attenuation coefficients for a meteorological range of approximately 25 km can be computed for all altitudes and wavelengths of interest.

TABLE 4. Aerosol number densities for a clear standard atmosphere

h (km)	Aerosol Density (cm^{-3})	Source
0	2.0×10^{2}	Reference 9
1	8.7×10^{1}	Scale height 1.2 km, Reference 24
2	3.8×10^{1}	
3	1.6×10^{1}	
4	7.2×10^{0}	
5	3.1×10^{0}	
6	1.1×10^{0}	Interpolation
7	4.0×10^{-1}	
8	1.4×10^{-1}	
9	5.0×10^{-2}	
10	2.6	
11	2.3	Reference 25
12	2.1	
13	2.3	
14	2.5	
15	4.1	
16	6.7	
17	7.3	
18	8.0	
19	9.0	
20	8.6	
21	8.2	
22	8.0	
23	7.6	
24	5.2	
25	3.6	
26	2.5	
27	2.4	
28	2.2	
29	2.0	Extrapolation
30	1.9	
31-50	0	Neglected

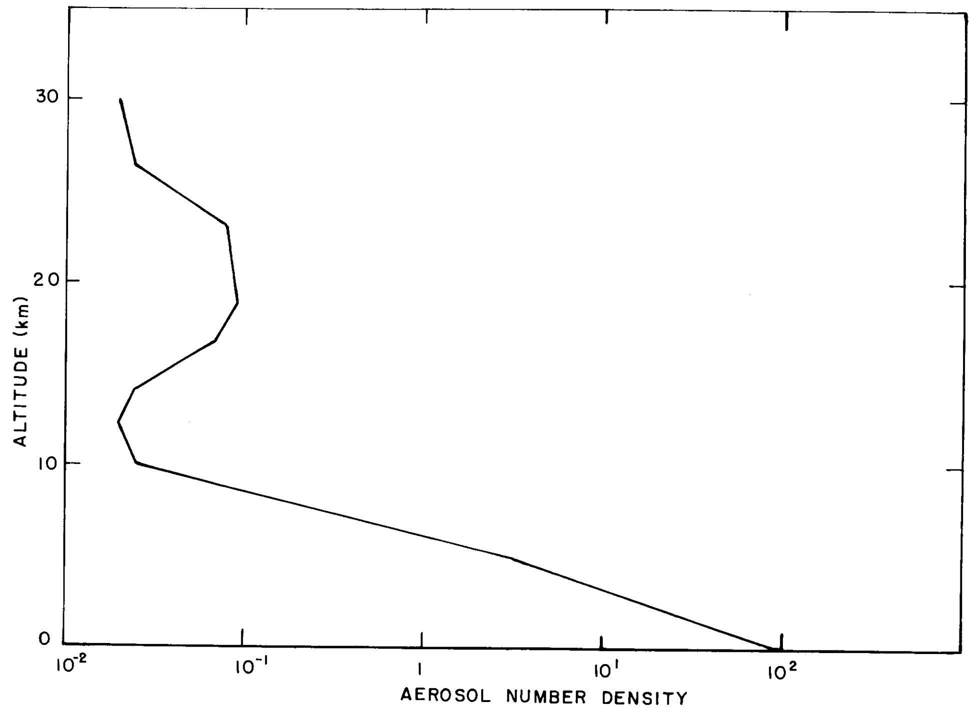

Figure 4. Representative Profile, Aerosol Number Density vs Altitude (see Table 4)

5. ATMOSPHERIC EXTINCTION

The term extinction is used to express more than one atmospheric attenuating component. In this section, three sets of extinction parameters are derived for each wavelength: extinction coefficients as a function of altitude, extinction optical thickness from sea level to a desired altitude, and extinction optical thickness from a desired altitude to space.

5.1 Extinction Coefficient vs Altitude

This is the sum of all the attenuating components,

$$\beta_{ext}(h) = \beta_r(h) + \beta_3(h) + \beta_p(h) \tag{8}$$

where

β_{ext} is the extinction coefficient as a function of altitude (km^{-1}),

β_r is the Rayleigh attenuation as a function of altitude (km^{-1}),

β_3 is the atmospheric ozone absorption coefficient as a function of altitude (km^{-1}),

and

β_p is the aerosol attenuation coefficient as a function of altitude (km^{-1}).

5.2 Extinction Optical Thickness from Sea Level to Altitude h

This parameter is expressed by

$$\tau_{ext} = \sum_{0}^{h} \overline{\beta}_{ext}(h) \cdot \Delta h \quad , \tag{9}$$

where

$\overline{\beta}_{ext}$ is the mean extinction coefficient (km^{-1}) for each altitude increment.

The altitude increment Δh was set at 1 km for these computations.

5.3 Extinction Optical Thickness from Altitude h to Space

The relationship is

$$\tau'_{ext}(h) = \tau_{ext}\infty - \tau_{ext}(h) \quad . \tag{10}$$

$\tau_{ext}(\infty)$ is the optical thickness from sea level to space and its value is obtained by using Eq.(9) with the limits set between 0 and 80 km. Above 80 km $\int_{80}^{\infty} \beta_{ext} dh$ can be neglected.

6. EXPLORATORY CALCULATIONS

Some exploratory calculations for any of the wavelengths used are demonstrated readily by a few general cases.

6.1 Horizontal Transmission

For horizontal transmission (T_h) over a path (d) at any altitude (h), the extinction coefficient (β_{ext}) for that altitude is used,

$$T_h = \exp -\left[\beta_{ext}(h) \cdot d\right] \quad . \tag{11}$$

6.2 Vertical and Slant-path Transmission from Sea Level to Altitude h

For vertical and slant-path transmission (T_{o-h}), from sea level to some altitude, the extinction optical thickness (τ_{ext}) for that altitude is used, and

$$T_{0-h} = \exp -\left[\tau_{ext}(h) \cdot \sec \theta\right] \tag{12}$$

where

θ is the zenith angle.

6.3 Vertical and Slant-path Transmission Between Two Altitudes Above Sea Level

For vertical and slant-path transmission ($T_{\Delta h}$) between two altitudes above sea level, and from the geometry of Figure 5,

$$T_{\Delta h} = \exp - \left[\tau_{ext}(h_2) - \tau_{ext}(h_1)\right] \sec\theta \tag{13}$$

where

$\tau_{ext}(h_1)$ is the extinction optical thickness at h_1,

and

$\tau_{ext}(h_2)$ is the extinction optical thickness at h_2.

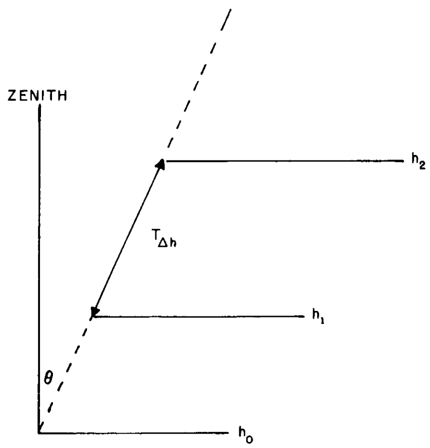

Figure 5. Geometry for Transmission Between Two Altitudes, h_1 and h_2

6.4 Vertical and Slant-path Transmission from Altitude h to Infinity

For vertical and slant-path transmission ($T_{h-\infty}$) from altitude h to infinity, the extinction optical thickness (τ'_{ext}) is used,

$$T_{h-\infty} = \exp - \left[\tau'_{ext}(h) \cdot \sec\theta\right] . \tag{14}$$

7. CONCLUDING REMARKS

The tabulations that follow can be considered as a model for atmospheric attenuation and ozone absorption to 50 km. The atmospheric coefficients and optical thickness values represent a clear standard atmosphere with 0.35 cm total ozone.

Parameters for Rayleigh attenuation are included since they are widely used. The format deals systematically with a multiplicity of variables thus permitting many kinds of exploratory calculations. It is expected that as additional knowledge is acquired, revisions may be necessary. For the present the tabulations conform to the best available information.

8. TABULATION OF PARAMETERS

TABLE 5.1. Parameters at 0.27 microns

Alt (km) h	Rayleigh atten. coeff. (km^{-1}) β_r	Rayleigh optical thick. (0-h) τ_r	Rayleigh optical thick. (h-∞) τ'_r	Aerosol atten. coeff. (km^{-1}) β_p	Ozone absorp. coeff. (km^{-1}) β_3	Ext. coeff. (km^{-1}) β_{ext}	Ext. optical thick. (0-h) τ_{ext}	Ext. optical thick. (h-∞) τ'_{ext}
0	2.282-001	0.0000	1.9314	2.90-001	7.48-001	1.27+000	0.000	73.253
1	2.071-001	0.2177	1.7137	1.28-001	6.65-001	1.02+000	1.143	72.111
2	1.875-001	0.4150	1.5164	5.51-002	6.15-001	8.58-001	2.081	71.172
3	1.694-001	0.5935	1.3380	2.32-002	5.25-001	7.18-001	2.869	70.384
4	1.527-001	0.7545	1.1769	1.04-002	4.75-001	6.38-001	3.547	69.707
5	1.372-001	0.8994	1.0320	4.64-003	4.64-001	6.06-001	4.168	69.085
6	1.230-001	1.0295	0.9019	1.60-003	4.54-001	5.78-001	4.761	68.493
7	1.099-001	1.1460	0.7854	5.80-004	4.68-001	5.79-001	5.339	67.914
8	9.796-002	1.2499	0.6815	2.03-004	4.79-001	5.77-001	5.917	67.336
9	8.702-002	1.3424	0.5890	7.25-005	5.90-001	6.77-001	6.544	66.709
10	7.704-002	1.4245	0.5070	3.77-005	7.35-001	8.12-001	7.289	65.965
11	6.797-002	1.4970	0.4345	3.48-005	9.66-001	1.03+000	8.212	65.042
12	5.812-002	1.5600	0.3714	3.19-005	1.30+000	1.36+000	9.410	63.844
13	4.967-002	1.6139	0.3175	3.48-005	1.77+000	1.82+000	11.003	62.250
14	4.245-002	1.6600	0.2715	3.77-005	2.01+000	2.05+000	12.941	60.312
15	3.628-002	1.6993	0.2321	6.09-005	2.09+000	2.12+000	15.029	58.224
16	3.102-002	1.7330	0.1985	9.86-005	2.16+000	2.19+000	17.188	56.065
17	2.651-002	1.7617	0.1697	1.07-004	2.33+000	2.36+000	19.464	53.789
18	2.266-002	1.7863	0.1451	1.16-004	2.56+000	2.58+000	21.935	51.318
19	1.938-002	1.8073	0.1241	1.30-004	2.98+000	3.00+000	24.728	48.525
20	1.656-002	1.8253	0.1061	1.25-004	3.44+000	3.46+000	27.959	45.294
21	1.410-002	1.8406	0.0908	1.19-004	3.86+000	3.88+000	31.629	41.625
22	1.202-002	1.8537	0.0777	1.16-004	4.14+000	4.15+000	35.643	37.611
23	1.025-002	1.8648	0.0666	1.10-004	4.16+000	4.17+000	39.801	33.452
24	8.744-003	1.8743	0.0571	7.54-005	4.05+000	4.06+000	43.916	29.337
25	7.467-003	1.8824	0.0490	5.22-005	3.78+000	3.79+000	47.841	25.412
26	6.381-003	1.8894	0.0421	3.77-005	3.42+000	3.43+000	51.449	21.804
27	5.458-003	1.8953	0.0361	3.48-005	2.96+000	2.97+000	54.647	18.606
28	4.671-003	1.9003	0.0311	3.19-005	2.58+000	2.59+000	57.425	15.829
29	4.001-003	1.9047	0.0267	2.90-005	2.25+000	2.25+000	59.844	13.409
30	3.430-003	1.9084	0.0230	2.75-005	1.90+000	1.90+000	61.919	11.334
31	2.942-003	1.9116	0.0198	0.00+000	1.67+000	1.67+000	63.703	9.550
32	2.525-003	1.9143	0.0171	0.00+000	1.43+000	1.43+000	65.255	7.999
33	2.156-003	1.9167	0.0148	0.00+000	1.22+000	1.22+000	66.584	6.669
34	1.842-003	1.9187	0.0128	0.00+000	1.01+000	1.02+000	67.705	5.549
35	1.577-003	1.9204	0.0111	0.00+000	9.05-001	9.07-001	68.666	4.587
36	1.352-003	1.9218	0.0096	0.00+000	7.58-001	7.59-001	69.499	3.754
37	1.162-003	1.9231	0.0083	0.00+000	6.34-001	6.35-001	70.196	3.057
38	9.997-004	1.9242	0.0073	0.00+000	5.31-001	5.32-001	70.780	2.473
39	8.619-004	1.9251	0.0063	0.00+000	4.56-001	4.57-001	71.275	1.979
40	7.443-004	1.9259	0.0055	0.00+000	3.91-001	3.91-001	71.699	1.555
41	6.439-004	1.9266	0.0048	0.00+000	3.19-001	3.20-001	72.054	1.199
42	5.579-004	1.9272	0.0042	0.00+000	2.50-001	2.50-001	72.339	0.914
43	4.841-004	1.9277	0.0037	0.00+000	1.95-001	1.96-001	72.563	0.691
44	4.208-004	1.9282	0.0033	0.00+000	1.56-001	1.57-001	72.739	0.515
45	3.663-004	1.9286	0.0029	0.00+000	1.21-001	1.21-001	72.878	0.376
46	3.193-004	1.9289	0.0025	0.00+000	9.37-002	9.40-002	72.985	0.268
47	2.788-004	1.9292	0.0022	0.00+000	7.41-002	7.44-002	73.070	0.184
48	2.453-004	1.9295	0.0020	0.00+000	5.86-002	5.88-002	73.136	0.117
49	2.166-004	1.9297	0.0017	0.00+000	4.68-002	4.70-002	73.189	0.064
50	1.913-004	1.9299	0.0015	0.00+000	3.91-002	3.93-002	73.232	0.021

All exponential numbers are designated by a sign following the number, then by two zeros and the exponent. Thus, 3.26-003 = 3.26×10^{-3}.

TABLE 5.2. Parameters at 0.28 microns

Alt (km) h	Rayleigh atten. coeff. (km^{-1}) β_r	Rayleigh optical thick. (0-h) τ_r	Rayleigh optical thick. (h-∞) τ'_r	Aerosol atten. coeff. (km^{-1}) β_p	Ozone absorp. coeff. (km^{-1}) β_3	Ext. coeff. (km^{-1}) β_{ext}	Ext. optical thick. (0-h) τ_{ext}	Ext. optical thick. (h-∞) τ'_{ext}
0	1.948-001	0.0000	1.6481	2.70-001	3.77-001	8.42-001	0.000	37.806
1	1.767-001	0.1858	1.4624	1.19-001	3.46-001	6.41-001	0.742	37.065
2	1.630-001	0.3541	1.2940	5.13-002	3.11-001	5.22-001	1.323	36.483
3	1.446-001	0.5064	1.1417	2.16-002	2.65-001	4.31-001	1.800	36.007
4	1.303-001	0.6438	1.0043	9.72-003	2.40-001	3.80-001	2.205	35.601
5	1.171-001	0.7675	0.8806	4.32-003	2.34-001	3.56-001	2.573	35.234
6	1.050-001	0.8785	0.7696	1.48-003	2.29-001	3.35-001	2.918	34.888
7	9.380-002	0.9779	0.6702	5.40-004	2.36-001	3.31-001	3.251	34.555
8	8.359-002	1.0666	0.5815	1.89-004	2.42-001	3.25-001	3.579	34.227
9	7.426-002	1.1455	0.5026	6.75-005	2.98-001	3.72-001	3.928	33.878
10	6.574-002	1.2155	0.4326	3.51-005	3.71-001	4.37-001	4.333	33.474
11	5.800-002	1.2774	0.3707	3.24-005	4.88-001	5.46-001	4.824	32.983
12	4.959-002	1.3312	0.3170	2.97-005	6.58-001	7.08-001	5.451	32.356
13	4.238-002	1.3772	0.2710	3.24-005	8.96-001	9.38-001	6.274	31.533
14	3.623-002	1.4165	0.2317	3.51-005	1.01+000	1.05+000	7.268	30.538
15	3.096-002	1.4501	0.1981	5.67-005	1.05+000	1.08+000	8.336	29.471
16	2.647-002	1.4788	0.1693	9.18-005	1.09+000	1.12+000	9.437	28.369
17	2.262-002	1.5033	0.1448	9.99-005	1.18+000	1.20+000	10.596	27.210
18	1.934-002	1.5243	0.1238	1.08-004	1.29+000	1.31+000	11.852	25.954
19	1.653-002	1.5423	0.1059	1.21-004	1.51+000	1.52+000	13.269	24.537
20	1.413-002	1.5576	0.0906	1.16-004	1.74+000	1.75+000	14.906	22.900
21	1.204-002	1.5707	0.0775	1.11-004	1.95+000	1.96+000	16.764	21.042
22	1.026-002	1.5818	0.0663	1.08-004	2.09+000	2.10+000	18.795	19.012
23	8.744-003	1.5913	0.0568	1.03-004	2.10+000	2.11+000	20.898	16.909
24	7.461-003	1.5994	0.0487	7.02-005	2.05+000	2.05+000	22.978	14.828
25	6.372-003	1.6063	0.0418	4.86-005	1.91+000	1.91+000	24.962	12.844
26	5.446-003	1.6123	0.0359	3.51-005	1.73+000	1.73+000	26.786	11.020
27	4.657-003	1.6173	0.0308	3.24-005	1.49+000	1.50+000	28.402	9.404
28	3.986-003	1.6216	0.0265	2.97-005	1.30+000	1.31+000	29.806	8.001
29	3.414-003	1.6253	0.0228	2.70-005	1.13+000	1.14+000	31.028	6.778
30	2.927-003	1.6285	0.0197	2.56-005	9.57-001	9.60-001	32.077	5.729
31	2.510-003	1.6312	0.0169	0.00+000	8.41-001	8.43-001	32.979	4.827
32	2.155-003	1.6335	0.0146	0.00+000	7.23-001	7.25-001	33.763	4.043
33	1.840-003	1.6355	0.0126	0.00+000	6.17-001	6.19-001	34.435	3.371
34	1.572-003	1.6373	0.0109	0.00+000	5.12-001	5.14-001	35.001	2.805
35	1.345-003	1.6387	0.0094	0.00+000	4.57-001	4.58-001	35.487	2.319
36	1.154-003	1.6400	0.0082	0.00+000	3.83-001	3.84-001	35.908	1.898
37	9.912-004	1.6410	0.0071	0.00+000	3.20-001	3.21-001	36.261	1.546
38	8.531-004	1.6420	0.0062	0.00+000	2.68-001	2.69-001	36.556	1.251
39	7.355-004	1.6427	0.0054	0.00+000	2.30-001	2.31-001	36.805	1.001
40	6.352-004	1.6434	0.0047	0.00+000	1.97-001	1.98-001	37.020	0.787
41	5.494-004	1.6440	0.0041	0.00+000	1.61-001	1.62-001	37.199	0.607
42	4.761-004	1.6445	0.0036	0.00+000	1.26-001	1.27-001	37.344	0.463
43	4.131-004	1.6450	0.0032	0.00+000	9.86-002	9.90-002	37.456	0.350
44	3.591-004	1.6454	0.0028	0.00+000	7.89-002	7.92-002	37.546	0.261
45	3.126-004	1.6457	0.0024	0.00+000	6.11-002	6.14-002	37.616	0.191
46	2.725-004	1.6460	0.0022	0.00+000	4.73-002	4.75-002	37.670	0.136
47	2.379-004	1.6463	0.0019	0.00+000	3.74-002	3.77-002	37.713	0.094
48	2.093-004	1.6465	0.0017	0.00+000	2.96-002	2.98-002	37.747	0.060
49	1.848-004	1.6467	0.0015	0.00+000	2.36-002	2.38-002	37.773	0.033
50	1.632-004	1.6468	0.0013	0.00+000	1.97-002	1.99-002	37.795	0.011

All exponential numbers are designated by a sign following the number, then by two zeros and the exponent. Thus, 3.26-003 = 3.26×10^{-3}.

TABLE 5.3. Parameters at 0.30 microns

Alt (km) h	Rayleigh atten. coeff. (km^{-1}) β_r	Rayleigh optical thick. (0-h) τ_r	Rayleigh optical thick. (h-∞) τ'_r	Aerosol atten. coeff. (km^{-1}) β_p	Ozone absorp. coeff. (km^{-1}) β_3	Ext. coeff. (km^{-1}) β_{ext}	Ext. optical thick. (0-h) τ_{ext}	Ext. optical thick. (h-∞) τ'_{ext}
0	1.446-001	0.0000	1.2237	2.60-001	3.60-002	4.41-001	0.000	4.968
1	1.312-001	0.1379	1.0858	1.14-001	3.29-002	2.79-001	0.360	4.608
2	1.188-001	0.2629	0.9607	4.94-002	2.96-002	1.98-001	0.598	4.370
3	1.073-001	0.3760	0.8477	2.08-002	2.52-002	1.53-001	0.773	4.194
4	9.671-002	0.4780	0.7456	9.36-003	2.28-002	1.29-001	0.914	4.053
5	8.693-002	0.5696	0.6538	4.16-003	2.23-002	1.13-001	1.036	3.932
6	7.792-002	0.6523	0.5714	1.43-003	2.18-002	1.01-001	1.143	3.825
7	6.964-002	0.7260	0.4976	5.20-004	2.25-002	9.27-002	1.240	3.728
8	6.206-002	0.7919	0.4318	1.82-004	2.30-002	8.53-002	1.329	3.639
9	5.513-002	0.8505	0.3732	6.50-005	2.84-002	8.36-002	1.413	3.555
10	4.881-002	0.9025	0.3212	3.38-005	3.53-002	8.42-002	1.497	3.471
11	4.306-002	0.9484	0.2753	3.12-005	4.65-002	8.96-002	1.584	3.384
12	3.682-002	0.9883	0.2353	2.86-005	6.27-002	9.96-002	1.679	3.289
13	3.147-002	1.0225	0.2012	3.12-005	8.53-002	1.17-001	1.787	3.181
14	2.690-002	1.0517	0.1720	3.38-005	9.67-002	1.24-001	1.907	3.061
15	2.299-002	1.0766	0.1471	5.46-005	1.00-001	1.23-001	2.030	2.937
16	1.965-002	1.0979	0.1257	8.84-005	1.04-001	1.24-001	2.154	2.814
17	1.680-002	1.1162	0.1075	9.62-005	1.12-001	1.29-001	2.280	2.687
18	1.436-002	1.1317	0.0919	1.04-004	1.23-001	1.38-001	2.414	2.554
19	1.228-002	1.1450	0.0786	1.17-004	1.43-001	1.56-001	2.561	2.407
20	1.049-002	1.1564	0.0672	1.12-004	1.66-001	1.76-001	2.727	2.241
21	8.936-003	1.1661	0.0575	1.07-004	1.86-001	1.95-001	2.912	2.056
22	7.614-003	1.1744	0.0492	1.04-004	1.99-001	2.07-001	3.113	1.855
23	6.492-003	1.1815	0.0422	9.88-005	2.00-001	2.07-001	3.320	1.648
24	5.540-003	1.1875	0.0362	6.76-005	1.95-001	2.01-001	3.523	1.445
25	4.731-003	1.1926	0.0310	4.68-005	1.82-001	1.87-001	3.717	1.251
26	4.043-003	1.1970	0.0267	3.38-005	1.65-001	1.69-001	3.894	1.073
27	3.458-003	1.2008	0.0229	3.12-005	1.42-001	1.46-001	4.052	0.916
28	2.960-003	1.2040	0.0197	2.86-005	1.24-001	1.27-001	4.188	0.780
29	2.535-003	1.2067	0.0169	2.60-005	1.08-001	1.11-001	4.307	0.661
30	2.173-003	1.2091	0.0146	2.47-005	9.12-002	9.34-002	4.409	0.559
31	1.864-003	1.2111	0.0126	0.00+000	8.01-002	8.20-002	4.497	0.471
32	1.600-003	1.2128	0.0108	0.00+000	6.89-002	7.05-002	4.573	0.395
33	1.366-003	1.2143	0.0094	0.00+000	5.88-002	6.01-002	4.638	0.329
34	1.167-003	1.2156	0.0081	0.00+000	4.88-002	4.99-002	4.693	0.274
35	9.989-004	1.2167	0.0070	0.00+000	4.35-002	4.45-002	4.741	0.227
36	8.566-004	1.2176	0.0061	0.00+000	3.65-002	3.73-002	4.782	0.186
37	7.359-004	1.2184	0.0053	0.00+000	3.05-002	3.12-002	4.816	0.152
38	6.334-004	1.2191	0.0046	0.00+000	2.56-002	2.62-002	4.845	0.123
39	5.461-004	1.2197	0.0040	0.00+000	2.19-002	2.25-002	4.869	0.099
40	4.716-004	1.2202	0.0035	0.00+000	1.88-002	1.93-002	4.890	0.078
41	4.079-004	1.2206	0.0031	0.00+000	1.54-002	1.58-002	4.907	0.060
42	3.534-004	1.2210	0.0027	0.00+000	1.20-002	1.24-002	4.921	0.046
43	3.067-004	1.2213	0.0024	0.00+000	9.39-003	9.70-003	4.932	0.035
44	2.666-004	1.2216	0.0021	0.00+000	7.51-003	7.78-003	4.941	0.027
45	2.321-004	1.2218	0.0018	0.00+000	5.82-003	6.05-003	4.948	0.020
46	2.023-004	1.2221	0.0016	0.00+000	4.50-003	4.71-003	4.953	0.014
47	1.766-004	1.2223	0.0014	0.00+000	3.57-003	3.74-003	4.958	0.010
48	1.554-004	1.2224	0.0012	0.00+000	2.82-003	2.97-003	4.961	0.007
49	1.372-004	1.2226	0.0011	0.00+000	2.25-003	2.39-003	4.964	0.004
50	1.212-004	1.2227	0.0010	0.00+000	1.88-003	2.00-003	4.966	0.002

All exponential numbers are designated by a sign following the number, then by two zeros and the exponent. Thus, $3.26\text{-}003 = 3.26 \times 10^{-3}$.

TABLE 5.4. Parameters at 0.32 microns

Alt (km) h	Rayleigh atten. coeff. (km^{-1}) β_r	Rayleigh optical thick. (0-h) τ_r	Rayleigh optical thick. (h-∞) τ'_r	Aerosol atten. coeff. (km^{-1}) β_p	Ozone absorp. coeff. (km^{-1}) β_3	Ext. coeff. (km^{-1}) β_{ext}	Ext. optical thick. (0-h) τ_{ext}	Ext. optical thick. (h-∞) τ'_{ext}
0	1.098-001	0.0000	0.9290	2.50-001	3.20-003	3.63-001	0.000	1.551
1	9.962-002	0.1047	0.8243	1.10-001	2.93-003	2.13-001	0.288	1.263
2	9.020-002	0.1996	0.7294	4.75-002	2.63-003	1.40-001	0.464	1.087
3	8.148-002	0.2854	0.6435	2.00-002	2.24-003	1.04-001	0.586	0.965
4	7.342-002	0.3629	0.5661	9.00-003	2.03-003	8.45-002	0.680	0.871
5	6.599-002	0.4326	0.4964	4.00-003	1.98-003	7.20-002	0.759	0.793
6	5.915-002	0.4952	0.4338	1.38-003	1.94-003	6.25-002	0.826	0.725
7	5.287-002	0.5512	0.3778	5.00-004	2.00-003	5.54-002	0.885	0.667
8	4.711-002	0.6012	0.3278	1.75-004	2.05-003	4.93-002	0.937	0.614
9	4.185-002	0.6457	0.2833	6.25-005	2.52-003	4.44-002	0.984	0.567
10	3.705-002	0.6851	0.2438	3.25-005	3.14-003	4.02-002	1.026	0.525
11	3.269-002	0.7200	0.2090	3.00-005	4.13-003	3.69-002	1.065	0.486
12	2.795-002	0.7503	0.1786	2.75-005	5.58-003	3.36-002	1.100	0.451
13	2.389-002	0.7762	0.1527	3.00-005	7.59-003	3.15-002	1.133	0.419
14	2.042-002	0.7984	0.1306	3.25-005	8.59-003	2.90-002	1.163	0.388
15	1.745-002	0.8173	0.1116	5.25-005	8.93-003	2.64-002	1.191	0.361
16	1.492-002	0.8335	0.0955	8.50-005	9.25-003	2.43-002	1.216	0.335
17	1.275-002	0.8473	0.0816	9.25-005	9.97-003	2.28-002	1.239	0.312
18	1.090-002	0.8592	0.0698	1.00-004	1.10-002	2.20-002	1.262	0.289
19	9.319-003	0.8693	0.0597	1.13-004	1.28-002	2.22-002	1.284	0.267
20	7.966-003	0.8779	0.0510	1.08-004	1.47-002	2.28-002	1.306	0.245
21	6.784-003	0.8853	0.0437	1.02-004	1.65-002	2.34-002	1.329	0.222
22	5.780-003	0.8916	0.0374	1.00-004	1.77-002	2.36-002	1.353	0.198
23	4.928-003	0.8969	0.0320	9.50-005	1.78-002	2.28-002	1.376	0.175
24	4.205-003	0.9015	0.0275	6.50-005	1.73-002	2.16-002	1.398	0.153
25	3.591-003	0.9054	0.0236	4.50-005	1.62-002	1.98-002	1.419	0.132
26	3.069-003	0.9087	0.0202	3.25-005	1.46-002	1.77-002	1.438	0.113
27	2.625-003	0.9116	0.0174	3.00-005	1.27-002	1.53-002	1.454	0.097
28	2.247-003	0.9140	0.0149	2.75-005	1.10-002	1.33-002	1.469	0.083
29	1.924-003	0.9161	0.0129	2.50-005	9.61-003	1.16-002	1.481	0.070
30	1.649-003	0.9179	0.0111	2.38-005	8.11-003	9.78-003	1.492	0.059
31	1.415-003	0.9194	0.0095	0.00+000	7.12-003	8.54-003	1.501	0.050
32	1.214-003	0.9207	0.0082	0.00+000	6.12-003	7.34-003	1.509	0.042
33	1.037-003	0.9219	0.0071	0.00+000	5.23-003	6.26-003	1.516	0.036
34	8.859-004	0.9228	0.0061	0.00+000	4.34-003	5.22-003	1.521	0.030
35	7.583-004	0.9236	0.0053	0.00+000	3.87-003	4.63-003	1.526	0.025
36	6.503-004	0.9243	0.0046	0.00+000	3.24-003	3.89-003	1.531	0.021
37	5.587-004	0.9249	0.0040	0.00+000	2.71-003	3.27-003	1.534	0.017
38	4.808-004	0.9255	0.0035	0.00+000	2.27-003	2.75-003	1.537	0.014
39	4.145-004	0.9259	0.0030	0.00+000	1.95-003	2.36-003	1.540	0.011
40	3.580-004	0.9263	0.0027	0.00+000	1.67-003	2.03-003	1.542	0.009
41	3.097-004	0.9266	0.0023	0.00+000	1.36-003	1.67-003	1.544	0.007
42	2.683-004	0.9269	0.0020	0.00+000	1.07-003	1.34-003	1.545	0.006
43	2.329-004	0.9272	0.0018	0.00+000	8.35-004	1.07-003	1.546	0.005
44	2.024-004	0.9274	0.0016	0.00+000	6.68-004	8.70-004	1.547	0.004
45	1.762-004	0.9276	0.0014	0.00+000	5.17-004	6.93-004	1.548	0.003
46	1.536-004	0.9277	0.0012	0.00+000	4.01-004	5.54-004	1.549	0.002
47	1.341-004	0.9279	0.0011	0.00+000	3.17-004	4.51-004	1.549	0.002
48	1.180-004	0.9280	0.0009	0.00+000	2.51-004	3.69-004	1.550	0.001
49	1.042-004	0.9281	0.0008	0.00+000	2.00-004	3.04-004	1.550	0.001
50	9.201-005	0.9282	0.0007	0.00+000	1.67-004	2.59-004	1.550	0.001

All exponential numbers are designated by a sign following the number, then by two zeros and the exponent. Thus, 3.26-003 = 3.26×10^{-3}.

TABLE 5.5. Parameters at 0.34 microns

Alt (km) h	Rayleigh atten. coeff. (km^{-1}) β_r	Rayleigh optical thick. (0-h) τ_r	Rayleigh optical thick. (h-∞) τ'_r	Aerosol atten. coeff. (km^{-1}) β_p	Ozone absorp. coeff. (km^{-1}) β_3	Ext. coeff. (km^{-1}) β_{ext}	Ext. optical thick. (0-h) τ_{ext}	Ext. optical thick. (h-∞) τ'_{ext}
0	8.494-002	0.0000	0.7188	2.40-001	2.28-004	3.25-001	0.000	1.046
1	7.708-002	0.0810	0.6378	1.06-001	2.09-004	1.83-001	0.254	0.792
2	6.979-002	0.1544	0.5643	4.56-002	1.88-004	1.16-001	0.403	0.643
3	6.304-002	0.2209	0.4979	1.92-002	1.60-004	8.24-002	0.502	0.544
4	5.681-002	0.2808	0.4380	8.64-003	1.45-004	6.56-002	0.576	0.470
5	5.106-002	0.3347	0.3840	3.84-003	1.41-004	5.50-002	0.637	0.410
6	4.577-002	0.3831	0.3356	1.32-003	1.38-004	4.72-002	0.688	0.359
7	4.091-002	0.4265	0.2923	4.80-004	1.43-004	4.15-002	0.732	0.314
8	3.645-002	0.4651	0.2536	1.68-004	1.46-004	3.68-002	0.771	0.275
9	3.238-002	0.4996	0.2192	6.00-005	1.80-004	3.26-002	0.806	0.241
10	2.867-002	0.5301	0.1887	3.12-005	2.24-004	2.89-002	0.837	0.210
11	2.529-002	0.5571	0.1617	2.88-005	2.94-004	2.56-002	0.864	0.183
12	2.163-002	0.5805	0.1382	2.64-005	3.97-004	2.21-002	0.888	0.159
13	1.848-002	0.6006	0.1182	2.88-005	5.41-004	1.91-002	0.908	0.138
14	1.580-002	0.6177	0.1010	3.12-005	6.12-004	1.64-002	0.926	0.120
15	1.350-002	0.6324	0.0864	5.04-005	6.36-004	1.42-002	0.941	0.105
16	1.154-002	0.6449	0.0739	8.16-005	6.59-004	1.23-002	0.955	0.092
17	9.866-003	0.6556	0.0631	8.88-005	7.10-004	1.07-002	0.966	0.080
18	8.434-003	0.6648	0.0540	9.60-005	7.81-004	9.31-003	0.976	0.070
19	7.210-003	0.6726	0.0462	1.08-004	9.09-004	8.23-003	0.985	0.062
20	6.164-003	0.6793	0.0395	1.03-004	1.05-003	7.32-003	0.993	0.054
21	5.249-003	0.6850	0.0338	9.84-005	1.18-003	6.52-003	1.000	0.047
22	4.472-003	0.6898	0.0289	9.60-005	1.26-003	5.83-003	1.006	0.041
23	3.813-003	0.6940	0.0248	9.12-005	1.27-003	5.17-003	1.011	0.035
24	3.254-003	0.6975	0.0212	6.24-005	1.24-003	4.55-003	1.016	0.030
25	2.779-003	0.7005	0.0182	4.32-005	1.15-003	3.97-003	1.020	0.026
26	2.375-003	0.7031	0.0157	3.12-005	1.04-003	3.45-003	1.024	0.022
27	2.031-003	0.7053	0.0135	2.88-005	9.02-004	2.96-003	1.027	0.019
28	1.738-003	0.7072	0.0116	2.64-005	7.87-004	2.55-003	1.030	0.016
29	1.489-003	0.7088	0.0100	2.40-005	6.85-004	2.20-003	1.032	0.014
30	1.276-003	0.7102	0.0086	2.28-005	5.78-004	1.88-003	1.034	0.012
31	1.095-003	0.7114	0.0074	0.00+000	5.08-004	1.60-003	1.036	0.010
32	9.397-004	0.7124	0.0064	0.00+000	4.36-004	1.38-003	1.038	0.009
33	8.023-004	0.7133	0.0055	0.00+000	3.72-004	1.17-003	1.039	0.008
34	6.854-004	0.7140	0.0048	0.00+000	3.09-004	9.95-004	1.040	0.006
35	5.867-004	0.7146	0.0041	0.00+000	2.76-004	8.63-004	1.041	0.006
36	5.031-004	0.7152	0.0036	0.00+000	2.31-004	7.34-004	1.042	0.005
37	4.323-004	0.7157	0.0031	0.00+000	1.93-004	6.26-004	1.042	0.004
38	3.720-004	0.7161	0.0027	0.00+000	1.62-004	5.34-004	1.043	0.003
39	3.207-004	0.7164	0.0024	0.00+000	1.39-004	4.60-004	1.044	0.003
40	2.770-004	0.7167	0.0021	0.00+000	1.19-004	3.96-004	1.044	0.003
41	2.396-004	0.7170	0.0018	0.00+000	9.73-005	3.37-004	1.044	0.002
42	2.076-004	0.7172	0.0016	0.00+000	7.62-005	2.84-004	1.045	0.002
43	1.802-004	0.7174	0.0014	0.00+000	5.95-005	2.40-004	1.045	0.002
44	1.566-004	0.7175	0.0012	0.00+000	4.76-005	2.04-004	1.045	0.001
45	1.363-004	0.7177	0.0011	0.00+000	3.69-005	1.73-004	1.045	0.001
46	1.188-004	0.7178	0.0009	0.00+000	2.85-005	1.47-004	1.045	0.001
47	1.037-004	0.7179	0.0008	0.00+000	2.26-005	1.26-004	1.046	0.001
48	9.128-005	0.7180	0.0007	0.00+000	1.79-005	1.09-004	1.046	0.001
49	8.061-005	0.7181	0.0006	0.00+000	1.43-005	9.49-005	1.046	0.001
50	7.119-005	0.7182	0.0006	0.00+000	1.19-005	8.31-005	1.046	0.001

All exponential numbers are designated by a sign following the number, then by two zeros and the exponent. Thus, 3.26-003 = 3.26×10^{-3}.

TABLE 5.6. Parameters at 0.36 microns

Alt (km) h	Rayleigh atten. coeff. (km^{-1}) β_r	Rayleigh optical thick. (0-h) τ_r	Rayleigh optical thick. (h-∞) τ'_r	Aerosol atten. coeff. (km^{-1}) β_p	Ozone absorp. coeff. (km^{-1}) β_3	Ext. coeff. (km^{-1}) β_{ext}	Ext. optical thick. (0-h) τ_{ext}	Ext. optical thick. (h-∞) τ'_{ext}
0	6.680-002	0.0000	0.5653	2.40-001	6.41-006	3.07-001	0.000	0.872
1	6.062-002	0.0637	0.5016	1.06-001	5.87-006	1.66-001	0.237	0.635
2	5.489-002	0.1215	0.4438	4.56-002	5.27-006	1.00-001	0.370	0.502
3	4.958-002	0.1737	0.3916	1.92-002	4.50-006	6.88-002	0.455	0.417
4	4.468-002	0.2208	0.3444	8.64-003	4.07-006	5.33-002	0.516	0.356
5	4.016-002	0.2632	0.3020	3.84-003	3.98-006	4.40-002	0.564	0.308
6	3.599-002	0.3013	0.2640	1.32-003	3.89-006	3.73-002	0.605	0.267
7	3.217-002	0.3354	0.2299	4.80-004	4.01-006	3.27-002	0.640	0.232
8	2.867-002	0.3658	0.1995	1.68-004	4.10-006	2.88-002	0.671	0.201
9	2.547-002	0.3929	0.1724	6.00-005	5.06-006	2.55-002	0.698	0.174
10	2.255-002	0.4169	0.1484	3.12-005	6.30-006	2.26-002	0.722	0.150
11	1.989-002	0.4381	0.1272	2.88-005	8.28-006	1.99-002	0.743	0.129
12	1.701-002	0.4566	0.1087	2.64-005	1.12-005	1.70-002	0.762	0.110
13	1.454-002	0.4723	0.0929	2.88-005	1.52-005	1.46-002	0.777	0.095
14	1.242-002	0.4858	0.0795	3.12-005	1.72-005	1.25-002	0.791	0.081
15	1.062-002	0.4973	0.0679	5.04-005	1.79-005	1.07-002	0.803	0.069
16	9.077-003	0.5072	0.0581	8.16-005	1.85-005	9.18-003	0.812	0.060
17	7.759-003	0.5156	0.0497	8.88-005	2.00-005	7.87-003	0.821	0.051
18	6.633-003	0.5228	0.0425	9.60-005	2.20-005	6.75-003	0.828	0.044
19	5.671-003	0.5289	0.0363	1.08-004	2.56-005	5.80-003	0.835	0.037
20	4.847-003	0.5342	0.0311	1.03-004	2.95-005	4.98-003	0.840	0.032
21	4.128-003	0.5387	0.0266	9.84-005	3.31-005	4.26-003	0.845	0.027
22	3.517-003	0.5425	0.0227	9.60-005	3.55-005	3.65-003	0.849	0.023
23	2.999-003	0.5458	0.0195	9.12-005	3.56-005	3.13-003	0.852	0.020
24	2.559-003	0.5486	0.0167	6.24-005	3.47-005	2.66-003	0.855	0.017
25	2.185-003	0.5509	0.0143	4.32-005	3.24-005	2.26-003	0.857	0.015
26	1.868-003	0.5530	0.0123	3.12-005	2.93-005	1.93-003	0.859	0.013
27	1.597-003	0.5547	0.0106	2.88-005	2.54-005	1.65-003	0.861	0.011
28	1.367-003	0.5562	0.0091	2.64-005	2.21-005	1.42-003	0.863	0.009
29	1.171-003	0.5574	0.0078	2.40-005	1.93-005	1.21-003	0.864	0.008
30	1.004-003	0.5585	0.0067	2.28-005	1.63-005	1.04-003	0.865	0.007
31	8.609-004	0.5595	0.0058	0.00+000	1.43-005	8.75-004	0.866	0.006
32	7.390-004	0.5603	0.0050	0.00+000	1.23-005	7.51-004	0.867	0.005
33	6.310-004	0.5609	0.0043	0.00+000	1.05-005	6.41-004	0.868	0.004
34	5.391-004	0.5615	0.0037	0.00+000	8.69-006	5.48-004	0.868	0.004
35	4.614-004	0.5620	0.0032	0.00+000	7.76-006	4.69-004	0.869	0.003
36	3.957-004	0.5625	0.0028	0.00+000	6.50-006	4.02-004	0.869	0.003
37	3.399-004	0.5628	0.0024	0.00+000	5.44-006	3.45-004	0.870	0.002
38	2.926-004	0.5631	0.0021	0.00+000	4.55-006	2.97-004	0.870	0.002
39	2.522-004	0.5634	0.0019	0.00+000	3.91-006	2.56-004	0.870	0.002
40	2.178-004	0.5636	0.0016	0.00+000	3.35-006	2.21-004	0.870	0.002
41	1.884-004	0.5638	0.0014	0.00+000	2.74-006	1.91-004	0.871	0.001
42	1.633-004	0.5640	0.0012	0.00+000	2.14-006	1.65-004	0.871	0.001
43	1.417-004	0.5642	0.0011	0.00+000	1.67-006	1.43-004	0.871	0.001
44	1.232-004	0.5643	0.0010	0.00+000	1.34-006	1.24-004	0.871	0.001
45	1.072-004	0.5644	0.0008	0.00+000	1.04-006	1.08-004	0.871	0.001
46	9.345-005	0.5645	0.0007	0.00+000	8.03-007	9.43-005	0.871	0.001
47	8.159-005	0.5646	0.0007	0.00+000	6.35-007	8.22-005	0.871	0.001
48	7.179-005	0.5647	0.0006	0.00+000	5.02-007	7.23-005	0.871	0.001
49	6.339-005	0.5648	0.0005	0.00+000	4.01-007	6.38-005	0.871	0.001
50	5.598-005	0.5648	0.0004	0.00+000	3.35-007	5.63-005	0.872	0.000

All exponential numbers are designated by a sign following the number, then by two zeros and the exponent. Thus, 3.26-003 = 3.26×10^{-3}.

TABLE 5.7. Parameters at 0.38 microns

Alt (km) h	Rayleigh atten. coeff. (km^{-1}) β_r	Rayleigh optical thick. (0-h) τ_r	Rayleigh optical thick. (h-∞) τ'_r	Aerosol atten. coeff. (km^{-1}) β_p	Ozone absorp. coeff. (km^{-1}) β_3	Ext. coeff. (km^{-1}) β_{ext}	Ext. optical thick. (0-h) τ_{ext}	Ext. optical thick. (h-∞) τ'_{ext}
0	5.327-002	0.0000	0.4508	2.30-001	0.00+000	2.83-001	0.000	0.744
1	4.834-002	0.0508	0.4000	1.01-001	0.00+000	1.50-001	0.216	0.528
2	4.377-002	0.0969	0.3539	4.37-002	0.00+000	8.75-002	0.335	0.409
3	3.954-002	0.1385	0.3123	1.84-002	0.00+000	5.79-002	0.408	0.337
4	3.563-002	0.1761	0.2747	8.28-003	0.00+000	4.39-002	0.459	0.286
5	3.202-002	0.2099	0.2409	3.68-003	0.00+000	3.57-002	0.498	0.246
6	2.871-002	0.2403	0.2105	1.27-003	0.00+000	3.00-002	0.531	0.213
7	2.566-002	0.2675	0.1833	4.60-004	0.00+000	2.61-002	0.559	0.185
8	2.286-002	0.2917	0.1591	1.61-004	0.00+000	2.30-002	0.584	0.160
9	2.031-002	0.3133	0.1375	5.75-005	0.00+000	2.04-002	0.605	0.139
10	1.798-002	0.3325	0.1183	2.99-005	0.00+000	1.80-002	0.625	0.119
11	1.586-002	0.3494	0.1014	2.76-005	0.00+000	1.59-002	0.642	0.103
12	1.356-002	0.3641	0.0867	2.53-005	0.00+000	1.36-002	0.656	0.088
13	1.159-002	0.3767	0.0741	2.76-005	0.00+000	1.16-002	0.669	0.075
14	9.908-003	0.3874	0.0634	2.99-005	0.00+000	9.94-003	0.680	0.064
15	8.469-003	0.3966	0.0542	4.83-005	0.00+000	8.52-003	0.689	0.055
16	7.239-003	0.4045	0.0463	7.82-005	0.00+000	7.32-003	0.697	0.047
17	6.188-003	0.4112	0.0396	8.51-005	0.00+000	6.27-003	0.704	0.040
18	5.290-003	0.4169	0.0339	9.20-005	0.00+000	5.38-003	0.710	0.035
19	4.522-003	0.4218	0.0290	1.03-004	0.00+000	4.63-003	0.715	0.030
20	3.866-003	0.4260	0.0248	9.89-005	0.00+000	3.96-003	0.719	0.025
21	3.292-003	0.4296	0.0212	9.43-005	0.00+000	3.39-003	0.722	0.022
22	2.805-003	0.4326	0.0181	9.20-005	0.00+000	2.90-003	0.726	0.019
23	2.391-003	0.4352	0.0155	8.74-005	0.00+000	2.48-003	0.728	0.016
24	2.041-003	0.4375	0.0133	5.98-005	0.00+000	2.10-003	0.731	0.014
25	1.743-003	0.4394	0.0114	4.14-005	0.00+000	1.78-003	0.733	0.012
26	1.489-003	0.4410	0.0098	2.99-005	0.00+000	1.52-003	0.734	0.010
27	1.274-003	0.4424	0.0084	2.76-005	0.00+000	1.30-003	0.736	0.009
28	1.090-003	0.4435	0.0073	2.53-005	0.00+000	1.12-003	0.737	0.007
29	9.338-004	0.4445	0.0062	2.30-005	0.00+000	9.57-004	0.738	0.006
30	8.004-004	0.4454	0.0054	2.18-005	0.00+000	8.22-004	0.739	0.005
31	6.866-004	0.4462	0.0046	0.00+000	0.00+000	6.87-004	0.740	0.005
32	5.893-004	0.4468	0.0040	0.00+000	0.00+000	5.89-004	0.740	0.004
33	5.032-004	0.4473	0.0034	0.00+000	0.00+000	5.03-004	0.741	0.003
34	4.299-004	0.4478	0.0030	0.00+000	0.00+000	4.30-004	0.741	0.003
35	3.680-004	0.4482	0.0026	0.00+000	0.00+000	3.68-004	0.742	0.003
36	3.156-004	0.4485	0.0022	0.00+000	0.00+000	3.16-004	0.742	0.002
37	2.711-004	0.4488	0.0019	0.00+000	0.00+000	2.71-004	0.742	0.002
38	2.333-004	0.4491	0.0017	0.00+000	0.00+000	2.33-004	0.742	0.002
39	2.012-004	0.4493	0.0015	0.00+000	0.00+000	2.01-004	0.743	0.001
40	1.737-004	0.4495	0.0013	0.00+000	0.00+000	1.74-004	0.743	0.001
41	1.503-004	0.4497	0.0011	0.00+000	0.00+000	1.50-004	0.743	0.001
42	1.302-004	0.4498	0.0010	0.00+000	0.00+000	1.30-004	0.743	0.001
43	1.130-004	0.4499	0.0009	0.00+000	0.00+000	1.13-004	0.743	0.001
44	9.821-005	0.4500	0.0008	0.00+000	0.00+000	9.82-005	0.743	0.001
45	8.549-005	0.4501	0.0007	0.00+000	0.00+000	8.55-005	0.743	0.001
46	7.453-005	0.4502	0.0006	0.00+000	0.00+000	7.45-005	0.744	0.001
47	6.507-005	0.4503	0.0005	0.00+000	0.00+000	6.51-005	0.744	0.001
48	5.725-005	0.4503	0.0005	0.00+000	0.00+000	5.72-005	0.744	0.000
49	5.056-005	0.4504	0.0004	0.00+000	0.00+000	5.06-005	0.744	0.000
50	4.465-005	0.4504	0.0004	0.00+000	0.00+000	4.46-005	0.744	0.000

All exponential numbers are designated by a sign following the number, then by two zeros and the exponent. Thus, $3.26\text{-}003 = 3.26 \times 10^{-3}$.

TABLE 5.8. Parameters at 0.40 microns

Alt (km) h	Rayleigh atten. coeff. (km^{-1}) β_r	Rayleigh optical thick. (0-h) τ_r	Rayleigh optical thick. (h-∞) τ'_r	Aerosol atten. coeff. (km^{-1}) β_p	Ozone absorp. coeff. (km^{-1}) β_3	Ext. coeff. (km^{-1}) β_{ext}	Ext. optical thick. (0-h) τ_{ext}	Ext. optical thick. (h-∞) τ'_{ext}
0	4.303-002	0.0000	0.3641	2.00-001	0.00+000	2.43-001	0.000	0.619
1	3.905-002	0.0410	0.3231	8.80-002	0.00+000	1.27-001	0.185	0.434
2	3.536-002	0.0782	0.2859	3.80-002	0.00+000	7.34-002	0.285	0.334
3	3.194-002	0.1119	0.2522	1.60-002	0.00+000	4.79-002	0.346	0.273
4	2.878-002	0.1422	0.2219	7.20-003	0.00+000	3.60-002	0.388	0.231
5	2.587-002	0.1696	0.1946	3.20-003	0.00+000	2.91-002	0.420	0.199
6	2.319-002	0.1941	0.1700	1.10-003	0.00+000	2.43-002	0.447	0.172
7	2.072-002	0.2160	0.1481	4.00-004	0.00+000	2.11-002	0.470	0.149
8	1.847-002	0.2356	0.1285	1.40-004	0.00+000	1.86-002	0.490	0.130
9	1.641-002	0.2531	0.1110	5.00-005	0.00+000	1.65-002	0.507	0.112
10	1.452-002	0.2685	0.0956	2.60-005	0.00+000	1.46-002	0.523	0.097
11	1.281-002	0.2822	0.0819	2.40-005	0.00+000	1.28-002	0.536	0.083
12	1.096-002	0.2941	0.0700	2.20-005	0.00+000	1.10-002	0.548	0.071
13	9.364-003	0.3043	0.0599	2.40-005	0.00+000	9.39-003	0.558	0.061
14	8.003-003	0.3129	0.0512	2.60-005	0.00+000	8.03-003	0.567	0.052
15	6.841-003	0.3204	0.0438	4.20-005	0.00+000	6.88-003	0.575	0.045
16	5.847-003	0.3267	0.0374	6.80-005	0.00+000	5.92-003	0.581	0.038
17	4.998-003	0.3321	0.0320	7.40-005	0.00+000	5.07-003	0.586	0.033
18	4.273-003	0.3368	0.0274	8.00-005	0.00+000	4.35-003	0.591	0.028
19	3.653-003	0.3407	0.0234	9.00-005	0.00+000	3.74-003	0.595	0.024
20	3.122-003	0.3441	0.0200	8.60-005	0.00+000	3.21-003	0.599	0.020
21	2.659-003	0.3470	0.0171	8.20-005	0.00+000	2.74-003	0.602	0.018
22	2.266-003	0.3495	0.0147	8.00-005	0.00+000	2.35-003	0.604	0.015
23	1.932-003	0.3516	0.0126	7.60-005	0.00+000	2.01-003	0.606	0.013
24	1.648-003	0.3534	0.0108	5.20-005	0.00+000	1.70-003	0.608	0.011
25	1.408-003	0.3549	0.0092	3.60-005	0.00+000	1.44-003	0.610	0.009
26	1.203-003	0.3562	0.0079	2.60-005	0.00+000	1.23-003	0.611	0.008
27	1.029-003	0.3573	0.0068	2.40-005	0.00+000	1.05-003	0.612	0.007
28	8.807-004	0.3583	0.0059	2.20-005	0.00+000	9.03-004	0.613	0.006
29	7.543-004	0.3591	0.0050	2.00-005	0.00+000	7.74-004	0.614	0.005
30	6.465-004	0.3598	0.0043	1.90-005	0.00+000	6.66-004	0.615	0.004
31	5.546-004	0.3604	0.0037	0.00+000	0.00+000	5.55-004	0.615	0.004
32	4.760-004	0.3609	0.0032	0.00+000	0.00+000	4.76-004	0.616	0.003
33	4.064-004	0.3613	0.0028	0.00+000	0.00+000	4.06-004	0.616	0.003
34	3.472-004	0.3617	0.0024	0.00+000	0.00+000	3.47-004	0.617	0.002
35	2.972-004	0.3620	0.0021	0.00+000	0.00+000	2.97-004	0.617	0.002
36	2.549-004	0.3623	0.0018	0.00+000	0.00+000	2.55-004	0.617	0.002
37	2.190-004	0.3626	0.0016	0.00+000	0.00+000	2.19-004	0.618	0.002
38	1.885-004	0.3628	0.0014	0.00+000	0.00+000	1.88-004	0.618	0.001
39	1.625-004	0.3629	0.0012	0.00+000	0.00+000	1.62-004	0.618	0.001
40	1.403-004	0.3631	0.0010	0.00+000	0.00+000	1.40-004	0.618	0.001
41	1.214-004	0.3632	0.0009	0.00+000	0.00+000	1.21-004	0.618	0.001
42	1.052-004	0.3633	0.0008	0.00+000	0.00+000	1.05-004	0.618	0.001
43	9.127-005	0.3634	0.0007	0.00+000	0.00+000	9.13-005	0.619	0.001
44	7.933-005	0.3635	0.0006	0.00+000	0.00+000	7.93-005	0.619	0.001
45	6.905-005	0.3636	0.0005	0.00+000	0.00+000	6.91-005	0.619	0.001
46	6.020-005	0.3636	0.0005	0.00+000	0.00+000	6.02-005	0.619	0.000
47	5.256-005	0.3637	0.0004	0.00+000	0.00+000	5.26-005	0.619	0.000
48	4.624-005	0.3638	0.0004	0.00+000	0.00+000	4.62-005	0.619	0.000
49	4.084-005	0.3638	0.0003	0.00+000	0.00+000	4.08-005	0.619	0.000
50	3.606-005	0.3638	0.0003	0.00+000	0.00+000	3.61-005	0.619	0.000

All exponential numbers are designated by a sign following the number, then by two zeros and the exponent. Thus, 3.26-003 = 3.26×10^{-3}.

TABLE 5.9. Parameters at 0.45 microns

Alt (km) h	Rayleigh atten. coeff. (km^{-1}) β_r	Rayleigh optical thick. (0-h) τ_r	Rayleigh optical thick. (h-∞) τ'_r	Aerosol atten. coeff. (km^{-1}) β_p	Ozone absorp. coeff. (km^{-1}) β_3	Ext. coeff. (km^{-1}) β_{ext}	Ext. optical thick. (0-h) τ_{ext}	Ext. optical thick. (h-∞) τ'_{ext}
0	2.644-002	0.0000	0.2238	1.80-001	1.25-005	2.06-001	0.000	0.455
1	2.400-002	0.0252	0.1986	7.92-002	1.14-005	1.03-001	0.155	0.300
2	2.173-002	0.0481	0.1757	3.42-002	1.03-005	5.59-002	0.234	0.220
3	1.963-002	0.0688	0.1550	1.44-002	8.75-006	3.40-002	0.279	0.175
4	1.769-002	0.0874	0.1364	6.48-003	7.91-006	2.42-002	0.308	0.146
5	1.590-002	0.1042	0.1196	2.88-003	7.73-006	1.88-002	0.330	0.125
6	1.425-002	0.1193	0.1045	9.90-004	7.56-006	1.52-002	0.347	0.108
7	1.274-002	0.1328	0.0910	3.60-004	7.80-006	1.31-002	0.361	0.093
8	1.135-002	0.1448	0.0790	1.26-004	7.98-006	1.15-002	0.373	0.081
9	1.008-002	0.1555	0.0682	4.50-005	9.83-006	1.01-002	0.384	0.070
10	8.926-003	0.1650	0.0587	2.34-005	1.22-005	8.96-003	0.394	0.061
11	7.875-003	0.1734	0.0503	2.16-005	1.61-005	7.91-003	0.402	0.052
12	6.734-003	0.1807	0.0430	1.98-005	2.17-005	6.78-003	0.410	0.045
13	5.755-003	0.1870	0.0368	2.16-005	2.96-005	5.81-003	0.416	0.039
14	4.919-003	0.1923	0.0315	2.34-005	3.35-005	4.98-003	0.421	0.033
15	4.204-003	0.1969	0.0269	3.78-005	3.48-005	4.28-003	0.426	0.029
16	3.593-003	0.2008	0.0230	6.12-005	3.60-005	3.69-003	0.430	0.025
17	3.072-003	0.2041	0.0197	6.66-005	3.88-005	3.18-003	0.433	0.021
18	2.626-003	0.2070	0.0168	7.20-005	4.27-005	2.74-003	0.436	0.018
19	2.245-003	0.2094	0.0144	8.10-005	4.97-005	2.38-003	0.439	0.016
20	1.919-003	0.2115	0.0123	7.74-005	5.74-005	2.05-003	0.441	0.013
21	1.634-003	0.2133	0.0105	7.38-005	6.44-005	1.77-003	0.443	0.012
22	1.392-003	0.2148	0.0090	7.20-005	6.90-005	1.53-003	0.445	0.010
23	1.187-003	0.2161	0.0077	6.84-005	6.93-005	1.32-003	0.446	0.008
24	1.013-003	0.2172	0.0066	4.68-005	6.76-005	1.13-003	0.447	0.007
25	8.651-004	0.2181	0.0057	3.24-005	6.30-005	9.61-004	0.448	0.006
26	7.394-004	0.2189	0.0049	2.34-005	5.70-005	8.20-004	0.449	0.005
27	6.323-004	0.2196	0.0042	2.16-005	4.93-005	7.03-004	0.450	0.005
28	5.412-004	0.2202	0.0036	1.98-005	4.31-005	6.04-004	0.451	0.004
29	4.636-004	0.2207	0.0031	1.80-005	3.74-005	5.19-004	0.451	0.003
30	3.973-004	0.2211	0.0027	1.71-005	3.16-005	4.46-004	0.452	0.003
31	3.408-004	0.2215	0.0023	0.00+000	2.78-005	3.69-004	0.452	0.002
32	2.926-004	0.2218	0.0020	0.00+000	2.39-005	3.16-004	0.452	0.002
33	2.498-004	0.2221	0.0017	0.00+000	2.04-005	2.70-004	0.453	0.002
34	2.134-004	0.2223	0.0015	0.00+000	1.69-005	2.30-004	0.453	0.002
35	1.827-004	0.2225	0.0013	0.00+000	1.51-005	1.98-004	0.453	0.001
36	1.566-004	0.2227	0.0011	0.00+000	1.26-005	1.69-004	0.453	0.001
37	1.346-004	0.2228	0.0010	0.00+000	1.06-005	1.45-004	0.454	0.001
38	1.158-004	0.2229	0.0008	0.00+000	8.86-006	1.25-004	0.454	0.001
39	9.986-005	0.2230	0.0007	0.00+000	7.59-006	1.07-004	0.454	0.001
40	8.624-005	0.2231	0.0006	0.00+000	6.51-006	9.27-005	0.454	0.001
41	7.460-005	0.2232	0.0006	0.00+000	5.32-006	7.99-005	0.454	0.001
42	6.464-005	0.2233	0.0005	0.00+000	4.16-006	6.88-005	0.454	0.001
43	5.609-005	0.2233	0.0004	0.00+000	3.25-006	5.93-005	0.454	0.000
44	4.875-005	0.2234	0.0004	0.00+000	2.60-006	5.14-005	0.454	0.000
45	4.244-005	0.2234	0.0003	0.00+000	2.02-006	4.45-005	0.454	0.000
46	3.700-005	0.2235	0.0003	0.00+000	1.56-006	3.86-005	0.454	0.000
47	3.230-005	0.2235	0.0003	0.00+000	1.24-006	3.35-005	0.454	0.000
48	2.842-005	0.2236	0.0002	0.00+000	9.77-007	2.94-005	0.454	0.000
49	2.510-005	0.2236	0.0002	0.00+000	7.80-007	2.59-005	0.454	0.000
50	2.216-005	0.2236	0.0002	0.00+000	6.51-007	2.28-005	0.454	0.000

All exponential numbers are designated by a sign following the number, then by two zeros and the exponent. Thus, 3.26-003 = 3.26×10^{-3}.

TABLE 5.10. Parameters at 0.50 microns

Alt (km) h	Rayleigh atten. coeff. (km^{-1}) β_r	Rayleigh optical thick. (0-h) τ_r	Rayleigh optical thick. (h-∞) τ'_r	Aerosol atten. coeff. (km^{-1}) β_p	Ozone absorp. coeff. (km^{-1}) β_3	Ext. coeff. (km^{-1}) β_{ext}	Ext. optical thick. (0-h) τ_{ext}	Ext. optical thick. (h-∞) τ'_{ext}
0	1.716-002	0.0000	0.1452	1.67-001	1.23-004	1.84-001	0.000	0.370
1	1.557-002	0.0164	0.1288	7.35-002	1.12-004	8.92-002	0.137	0.233
2	1.410-002	0.0312	0.1140	3.17-002	1.01-004	4.59-002	0.204	0.166
3	1.274-002	0.0446	0.1006	1.34-002	8.62-005	2.62-002	0.240	0.130
4	1.148-002	0.0567	0.0885	6.01-003	7.80-005	1.76-002	0.262	0.108
5	1.031-002	0.0676	0.0776	2.67-003	7.62-005	1.31-002	0.278	0.092
6	9.246-003	0.0774	0.0678	9.18-004	7.45-005	1.02-002	0.289	0.081
7	8.264-003	0.0862	0.0590	3.34-004	7.69-005	8.67-003	0.299	0.071
8	7.364-003	0.0940	0.0512	1.17-004	7.87-005	7.56-003	0.307	0.063
9	6.542-003	0.1009	0.0443	4.17-005	9.69-005	6.68-003	0.314	0.056
10	5.792-003	0.1071	0.0381	2.17-005	1.21-004	5.93-003	0.320	0.050
11	5.109-003	0.1125	0.0327	2.00-005	1.59-004	5.29-003	0.326	0.044
12	4.369-003	0.1173	0.0279	1.84-005	2.14-004	4.60-003	0.331	0.039
13	3.734-003	0.1213	0.0239	2.00-005	2.92-004	4.05-003	0.335	0.035
14	3.191-003	0.1248	0.0204	2.17-005	3.30-004	3.54-003	0.339	0.031
15	2.728-003	0.1277	0.0174	3.51-005	3.43-004	3.11-003	0.342	0.028
16	2.332-003	0.1303	0.0149	5.68-005	3.55-004	2.74-003	0.345	0.025
17	1.993-003	0.1324	0.0128	6.18-005	3.83-004	2.44-003	0.348	0.022
18	1.704-003	0.1343	0.0109	6.68-005	4.21-004	2.19-003	0.350	0.020
19	1.457-003	0.1359	0.0093	7.51-005	4.90-004	2.02-003	0.352	0.018
20	1.245-003	0.1372	0.0080	7.18-005	5.66-004	1.88-003	0.354	0.016
21	1.060-003	0.1384	0.0068	6.85-005	6.35-004	1.76-003	0.356	0.014
22	9.034-004	0.1394	0.0058	6.68-005	6.80-004	1.65-003	0.358	0.012
23	7.703-004	0.1402	0.0050	6.35-005	6.83-004	1.52-003	0.359	0.011
24	6.573-004	0.1409	0.0043	4.34-005	6.66-004	1.37-003	0.361	0.009
25	5.613-004	0.1415	0.0037	3.01-005	6.21-004	1.21-003	0.362	0.008
26	4.797-004	0.1420	0.0032	2.17-005	5.62-004	1.06-003	0.363	0.007
27	4.103-004	0.1425	0.0027	2.00-005	4.86-004	9.17-004	0.364	0.006
28	3.512-004	0.1429	0.0023	1.84-005	4.24-004	7.94-004	0.365	0.005
29	3.008-004	0.1432	0.0020	1.67-005	3.69-004	6.87-004	0.366	0.004
30	2.578-004	0.1435	0.0017	1.59-005	3.12-004	5.85-004	0.366	0.004
31	2.211-004	0.1437	0.0015	0.00+000	2.74-004	4.95-004	0.367	0.003
32	1.898-004	0.1439	0.0013	0.00+000	2.35-004	4.25-004	0.367	0.003
33	1.621-004	0.1441	0.0011	0.00+000	2.01-004	3.63-004	0.368	0.002
34	1.385-004	0.1442	0.0010	0.00+000	1.67-004	3.05-004	0.368	0.002
35	1.185-004	0.1444	0.0008	0.00+000	1.49-004	2.67-004	0.368	0.002
36	1.016-004	0.1445	0.0007	0.00+000	1.25-004	2.26-004	0.369	0.001
37	8.732-005	0.1446	0.0006	0.00+000	1.04-004	1.92-004	0.369	0.001
38	7.516-005	0.1447	0.0005	0.00+000	8.73-005	1.62-004	0.369	0.001
39	6.479-005	0.1447	0.0005	0.00+000	7.49-005	1.40-004	0.369	0.001
40	5.596-005	0.1448	0.0004	0.00+000	6.42-005	1.20-004	0.369	0.001
41	4.840-005	0.1448	0.0004	0.00+000	5.24-005	1.01-004	0.369	0.001
42	4.194-005	0.1449	0.0003	0.00+000	4.11-005	8.30-005	0.369	0.000
43	3.640-005	0.1449	0.0003	0.00+000	3.21-005	6.85-005	0.369	0.000
44	3.163-005	0.1450	0.0002	0.00+000	2.57-005	5.73-005	0.370	0.000
45	2.754-005	0.1450	0.0002	0.00+000	1.99-005	4.74-005	0.370	0.000
46	2.400-005	0.1450	0.0002	0.00+000	1.54-005	3.94-005	0.370	0.000
47	2.096-005	0.1450	0.0002	0.00+000	1.22-005	3.31-005	0.370	0.000
48	1.844-005	0.1450	0.0001	0.00+000	9.63-006	2.81-005	0.370	0.000
49	1.628-005	0.1451	0.0001	0.00+000	7.69-006	2.40-005	0.370	0.000
50	1.438-005	0.1451	0.0001	0.00+000	6.42-006	2.08-005	0.370	0.000

All exponential numbers are designated by a sign following the number, then by two zeros and the exponent. Thus, 3.26-003 = 3.26×10^{-3}.

TABLE 5.11. Parameters at 0.55 microns

Alt (km) h	Rayleigh atten. coeff. (km^{-1}) β_r	Rayleigh optical thick. (0-h) τ_r	Rayleigh optical thick. (h-∞) τ'_r	Aerosol atten. coeff. (km^{-1}) β_p	Ozone absorp. coeff. (km^{-1}) β_3	Ext. coeff. (km^{-1}) β_{ext}	Ext. optical thick. (0-h) τ_{ext}	Ext. optical thick. (h-∞) τ'_{ext}
0	1.162-002	0.0000	0.0984	1.58-001	3.28-004	1.70-001	0.000	0.331
1	1.055-002	0.0111	0.0873	6.95-002	3.00-004	8.04-002	0.125	0.206
2	9.552-003	0.0211	0.0772	3.00-002	2.70-004	3.98-002	0.185	0.146
3	8.628-003	0.0302	0.0681	1.26-002	2.30-004	2.15-002	0.216	0.115
4	7.775-003	0.0384	0.0599	5.69-003	2.08-004	1.37-002	0.234	0.097
5	6.988-003	0.0458	0.0526	2.53-003	2.03-004	9.72-003	0.245	0.086
6	6.264-003	0.0524	0.0459	8.69-004	1.99-004	7.33-003	0.254	0.077
7	5.599-003	0.0584	0.0400	3.16-004	2.05-004	6.12-003	0.260	0.071
8	4.989-003	0.0637	0.0347	1.11-004	2.10-004	5.31-003	0.266	0.065
9	4.432-003	0.0684	0.0300	3.95-005	2.59-004	4.73-003	0.271	0.060
10	3.924-003	0.0726	0.0258	2.05-005	3.22-004	4.27-003	0.276	0.055
11	3.462-003	0.0762	0.0221	1.90-005	4.23-004	3.90-003	0.280	0.051
12	2.960-003	0.0795	0.0189	1.74-005	5.71-004	3.55-003	0.284	0.047
13	2.530-003	0.0822	0.0162	1.90-005	7.77-004	3.33-003	0.287	0.044
14	2.162-003	0.0845	0.0138	2.05-005	8.80-004	3.06-003	0.290	0.041
15	1.848-003	0.0865	0.0118	3.32-005	9.14-004	2.80-003	0.293	0.038
16	1.580-003	0.0883	0.0101	5.37-005	9.48-004	2.58-003	0.296	0.035
17	1.350-003	0.0897	0.0086	5.85-005	1.02-003	2.43-003	0.298	0.033
18	1.154-003	0.0910	0.0074	6.32-005	1.12-003	2.34-003	0.301	0.030
19	9.868-004	0.0921	0.0063	7.11-005	1.31-003	2.36-003	0.303	0.028
20	8.436-004	0.0930	0.0054	6.79-005	1.51-003	2.42-003	0.305	0.026
21	7.184-004	0.0937	0.0046	6.48-005	1.69-003	2.48-003	0.308	0.023
22	6.121-004	0.0944	0.0040	6.32-005	1.81-003	2.49-003	0.310	0.021
23	5.219-004	0.0950	0.0034	6.00-005	1.82-003	2.40-003	0.313	0.018
24	4.453-004	0.0955	0.0029	4.11-005	1.78-003	2.26-003	0.315	0.016
25	3.803-004	0.0959	0.0025	2.84-005	1.66-003	2.06-003	0.317	0.014
26	3.250-004	0.0962	0.0021	2.05-005	1.50-003	1.85-003	0.319	0.012
27	2.780-004	0.0965	0.0018	1.90-005	1.30-003	1.59-003	0.321	0.010
28	2.379-004	0.0968	0.0016	1.74-005	1.13-003	1.39-003	0.322	0.009
29	2.038-004	0.0970	0.0014	1.58-005	9.84-004	1.20-003	0.324	0.007
30	1.747-004	0.0972	0.0012	1.50-005	8.31-004	1.02-003	0.325	0.006
31	1.498-004	0.0974	0.0010	0.00+000	7.30-004	8.79-004	0.326	0.005
32	1.286-004	0.0975	0.0009	0.00+000	6.27-004	7.56-004	0.327	0.004
33	1.098-004	0.0976	0.0008	0.00+000	5.35-004	6.45-004	0.327	0.004
34	9.381-005	0.0977	0.0007	0.00+000	4.44-004	5.38-004	0.328	0.003
35	8.030-005	0.0978	0.0006	0.00+000	3.97-004	4.77-004	0.328	0.003
36	6.886-005	0.0979	0.0005	0.00+000	3.32-004	4.01-004	0.329	0.002
37	5.916-005	0.0979	0.0004	0.00+000	2.78-004	3.37-004	0.329	0.002
38	5.092-005	0.0980	0.0004	0.00+000	2.33-004	2.84-004	0.330	0.001
39	4.390-005	0.0980	0.0003	0.00+000	2.00-004	2.44-004	0.330	0.001
40	3.791-005	0.0981	0.0003	0.00+000	1.71-004	2.09-004	0.330	0.001
41	3.279-005	0.0981	0.0002	0.00+000	1.40-004	1.73-004	0.330	0.001
42	2.841-005	0.0982	0.0002	0.00+000	1.09-004	1.38-004	0.330	0.001
43	2.466-005	0.0982	0.0002	0.00+000	8.56-005	1.10-004	0.330	0.000
44	2.143-005	0.0982	0.0002	0.00+000	6.84-005	8.99-005	0.331	0.000
45	1.866-005	0.0982	0.0001	0.00+000	5.30-005	7.16-005	0.331	0.000
46	1.626-005	0.0982	0.0001	0.00+000	4.10-005	5.73-005	0.331	0.000
47	1.420-005	0.0983	0.0001	0.00+000	3.25-005	4.67-005	0.331	0.000
48	1.249-005	0.0983	0.0001	0.00+000	2.57-005	3.82-005	0.331	0.000
49	1.103-005	0.0983	0.0001	0.00+000	2.05-005	3.15-005	0.331	0.000
50	9.743-006	0.0983	0.0001	0.00+000	1.71-005	2.69-005	0.331	0.000

All exponential numbers are designated by a sign following the number, then by two zeros and the exponent. Thus, 3.26-003 = 3.26×10^{-3}.

TABLE 5.12. Parameters at 0.60 microns

Alt (km) h	Rayleigh atten. coeff. (km^{-1}) β_r	Rayleigh optical thick. (0-h) τ_r	Rayleigh optical thick. (h-∞) τ'_r	Aerosol atten. coeff. (km^{-1}) β_p	Ozone absorp. coeff. (km^{-1}) β_3	Ext. coeff. (km^{-1}) β_{ext}	Ext. optical thick. (0-h) τ_{ext}	Ext. optical thick. (h-∞) τ'_{ext}
0	8.157-003	0.0000	0.0690	1.50-001	4.70-004	1.59-001	0.000	0.305
1	7.402-003	0.0076	0.0613	6.60-002	4.30-004	7.38-002	0.116	0.189
2	6.703-003	0.0148	0.0542	2.85-002	3.87-004	3.56-002	0.171	0.134
3	6.055-003	0.0212	0.0478	1.20-002	3.30-004	1.84-002	0.198	0.107
4	5.456-003	0.0270	0.0421	5.40-003	2.98-004	1.12-002	0.213	0.092
5	4.904-003	0.0321	0.0369	2.40-003	2.92-004	7.60-003	0.222	0.083
6	4.396-003	0.0368	0.0322	8.25-004	2.85-004	5.51-003	0.229	0.076
7	3.929-003	0.0410	0.0281	3.00-004	2.94-004	4.52-003	0.234	0.071
8	3.501-003	0.0447	0.0244	1.05-004	3.01-004	3.91-003	0.238	0.067
9	3.110-003	0.0480	0.0211	3.75-005	3.71-004	3.52-003	0.242	0.063
10	2.753-003	0.0509	0.0181	1.95-005	4.62-004	3.23-003	0.245	0.060
11	2.429-003	0.0535	0.0155	1.80-005	6.07-004	3.05-003	0.248	0.057
12	2.077-003	0.0558	0.0133	1.65-005	8.20-004	2.91-003	0.251	0.054
13	1.775-003	0.0577	0.0113	1.80-005	1.12-003	2.91-003	0.254	0.051
14	1.517-003	0.0593	0.0097	1.95-005	1.26-003	2.80-003	0.257	0.048
15	1.297-003	0.0607	0.0083	3.15-005	1.31-003	2.64-003	0.260	0.045
16	1.109-003	0.0619	0.0071	5.10-005	1.36-003	2.52-003	0.262	0.043
17	9.476-004	0.0630	0.0061	5.55-005	1.47-003	2.47-003	0.265	0.040
18	8.100-004	0.0638	0.0052	6.00-005	1.61-003	2.48-003	0.267	0.038
19	6.925-004	0.0646	0.0044	6.75-005	1.87-003	2.63-003	0.270	0.035
20	5.920-004	0.0652	0.0038	6.45-005	2.16-003	2.82-003	0.272	0.033
21	5.041-004	0.0658	0.0032	6.15-005	2.43-003	2.99-003	0.275	0.030
22	4.295-004	0.0663	0.0028	6.00-005	2.60-003	3.09-003	0.278	0.027
23	3.662-004	0.0667	0.0024	5.70-005	2.61-003	3.04-003	0.281	0.024
24	3.125-004	0.0670	0.0020	3.90-005	2.55-003	2.90-003	0.284	0.021
25	2.669-004	0.0673	0.0018	2.70-005	2.38-003	2.67-003	0.287	0.018
26	2.281-004	0.0675	0.0015	1.95-005	2.15-003	2.40-003	0.290	0.015
27	1.951-004	0.0677	0.0013	1.80-005	1.86-003	2.07-003	0.292	0.013
28	1.670-004	0.0679	0.0011	1.65-005	1.62-003	1.81-003	0.294	0.011
29	1.430-004	0.0681	0.0010	1.50-005	1.41-003	1.57-003	0.296	0.009
30	1.226-004	0.0682	0.0008	1.42-005	1.19-003	1.33-003	0.297	0.008
31	1.051-004	0.0683	0.0007	0.00+000	1.05-003	1.15-003	0.298	0.007
32	9.025-005	0.0684	0.0006	0.00+000	9.00-004	9.90-004	0.299	0.006
33	7.705-005	0.0685	0.0005	0.00+000	7.68-004	8.45-004	0.300	0.005
34	6.583-005	0.0686	0.0005	0.00+000	6.38-004	7.03-004	0.301	0.004
35	5.635-005	0.0686	0.0004	0.00+000	5.69-004	6.25-004	0.302	0.003
36	4.832-005	0.0687	0.0003	0.00+000	4.77-004	5.25-004	0.302	0.003
37	4.151-005	0.0687	0.0003	0.00+000	3.99-004	4.40-004	0.303	0.002
38	3.573-005	0.0688	0.0003	0.00+000	3.34-004	3.70-004	0.303	0.002
39	3.080-005	0.0688	0.0002	0.00+000	2.86-004	3.17-004	0.303	0.001
40	2.660-005	0.0688	0.0002	0.00+000	2.46-004	2.72-004	0.304	0.001
41	2.301-005	0.0689	0.0002	0.00+000	2.01-004	2.24-004	0.304	0.001
42	1.994-005	0.0689	0.0002	0.00+000	1.57-004	1.77-004	0.304	0.001
43	1.730-005	0.0689	0.0001	0.00+000	1.23-004	1.40-004	0.304	0.001
44	1.504-005	0.0689	0.0001	0.00+000	9.82-005	1.13-004	0.305	0.000
45	1.309-005	0.0689	0.0001	0.00+000	7.60-005	8.91-005	0.305	0.000
46	1.141-005	0.0689	0.0001	0.00+000	5.89-005	7.03-005	0.305	0.000
47	9.964-006	0.0690	0.0001	0.00+000	4.66-005	5.66-005	0.305	0.000
48	8.766-006	0.0690	0.0001	0.00+000	3.68-005	4.56-005	0.305	0.000
49	7.742-006	0.0690	0.0001	0.00+000	2.94-005	3.72-005	0.305	0.000
50	6.837-006	0.0690	0.0001	0.00+000	2.46-005	3.14-005	0.305	0.000

All exponential numbers are designated by a sign following the number, then by two zeros and the exponent. Thus, 3.26-003 = 3.26×10^{-3}.

TABLE 5.13. Parameters at 0.65 microns

Alt (km) h	Rayleigh atten. coeff. (km^{-1}) β_r	Rayleigh optical thick. (0-h) τ_r	Rayleigh optical thick. (h-∞) τ'_r	Aerosol atten. coeff. (km^{-1}) β_p	Ozone absorp. coeff. (km^{-1}) β_3	Ext. coeff. (km^{-1}) β_{ext}	Ext. optical thick. (0-h) τ_{ext}	Ext. optical thick. (h-∞) τ'_{ext}
0	5.893-003	0.0000	0.0499	1.42-001	2.21-004	1.48-001	0.000	0.252
1	5.347-003	0.0056	0.0442	6.25-002	2.02-004	6.80-002	0.108	0.144
2	4.842-003	0.0107	0.0392	2.70-002	1.82-004	3.20-002	0.158	0.094
3	4.374-003	0.0153	0.0345	1.14-002	1.55-004	1.59-002	0.182	0.070
4	3.941-003	0.0195	0.0304	5.11-003	1.40-004	9.19-003	0.195	0.057
5	3.542-003	0.0232	0.0266	2.27-003	1.37-004	5.95-003	0.202	0.050
6	3.175-003	0.0266	0.0233	7.81-004	1.34-004	4.09-003	0.207	0.045
7	2.838-003	0.0296	0.0203	2.84-004	1.38-004	3.26-003	0.211	0.041
8	2.529-003	0.0323	0.0176	9.94-005	1.41-004	2.77-003	0.214	0.038
9	2.247-003	0.0347	0.0152	3.55-005	1.74-004	2.46-003	0.216	0.035
10	1.989-003	0.0368	0.0131	1.85-005	2.17-004	2.22-003	0.219	0.033
11	1.755-003	0.0386	0.0112	1.70-005	2.85-004	2.06-003	0.221	0.031
12	1.590-003	0.0403	0.0096	1.56-005	3.85-004	1.90-003	0.223	0.029
13	1.282-003	0.0417	0.0082	1.70-005	5.24-004	1.82-003	0.225	0.027
14	1.096-003	0.0429	0.0070	1.85-005	5.93-004	1.71-003	0.227	0.025
15	9.368-004	0.0439	0.0060	2.98-005	6.16-004	1.58-003	0.228	0.024
16	8.007-004	0.0447	0.0051	4.83-005	6.39-004	1.49-003	0.230	0.022
17	6.845-004	0.0455	0.0044	5.25-005	6.88-004	1.43-003	0.231	0.021
18	5.851-004	0.0461	0.0037	5.68-005	7.56-004	1.40-003	0.233	0.019
19	5.002-004	0.0467	0.0032	6.39-005	8.80-004	1.44-003	0.234	0.018
20	4.276-004	0.0471	0.0027	6.11-005	1.02-003	1.51-003	0.236	0.016
21	3.641-004	0.0475	0.0023	5.82-005	1.14-003	1.56-003	0.237	0.015
22	3.103-004	0.0479	0.0020	5.68-005	1.22-003	1.59-003	0.239	0.013
23	2.645-004	0.0481	0.0017	5.40-005	1.23-003	1.55-003	0.240	0.012
24	2.257-004	0.0484	0.0015	3.69-005	1.20-003	1.46-003	0.242	0.010
25	1.928-004	0.0486	0.0013	2.56-005	1.12-003	1.33-003	0.243	0.009
26	1.648-004	0.0488	0.0011	1.85-005	1.01-003	1.19-003	0.244	0.008
27	1.409-004	0.0489	0.0009	1.70-005	8.74-004	1.03-003	0.245	0.006
28	1.206-004	0.0491	0.0008	1.56-005	7.63-004	8.99-004	0.246	0.006
29	1.033-004	0.0492	0.0007	1.42-005	6.63-004	7.81-004	0.247	0.005
30	8.854-005	0.0493	0.0006	1.35-005	5.60-004	6.62-004	0.248	0.004
31	7.595-005	0.0494	0.0005	0.00+000	4.92-004	5.68-004	0.249	0.003
32	6.519-005	0.0494	0.0004	0.00+000	4.23-004	4.88-004	0.249	0.003
33	5.566-005	0.0495	0.0004	0.00+000	3.61-004	4.17-004	0.250	0.002
34	4.755-005	0.0495	0.0003	0.00+000	2.99-004	3.47-004	0.250	0.002
35	4.070-005	0.0496	0.0003	0.00+000	2.67-004	3.08-004	0.250	0.002
36	3.491-005	0.0496	0.0002	0.00+000	2.24-004	2.59-004	0.251	0.001
37	2.999-005	0.0496	0.0002	0.00+000	1.87-004	2.17-004	0.251	0.001
38	2.581-005	0.0497	0.0002	0.00+000	1.57-004	1.83-004	0.251	0.001
39	2.225-005	0.0497	0.0002	0.00+000	1.35-004	1.57-004	0.251	0.001
40	1.922-005	0.0497	0.0001	0.00+000	1.15-004	1.35-004	0.251	0.001
41	1.662-005	0.0497	0.0001	0.00+000	9.42-005	1.11-004	0.251	0.000
42	1.440-005	0.0498	0.0001	0.00+000	7.38-005	8.82-005	0.252	0.000
43	1.250-005	0.0498	0.0001	0.00+000	5.77-005	7.02-005	0.252	0.000
44	1.086-005	0.0498	0.0001	0.00+000	4.61-005	5.70-005	0.252	0.000
45	9.457-006	0.0498	0.0001	0.00+000	3.57-005	4.52-005	0.252	0.000
46	8.244-006	0.0498	0.0001	0.00+000	2.77-005	3.59-005	0.252	0.000
47	7.197-006	0.0498	0.0001	0.00+000	2.19-005	2.91-005	0.252	0.000
48	6.333-006	0.0498	0.0001	0.00+000	1.73-005	2.36-005	0.252	0.000
49	5.592-006	0.0498	0.0000	0.00+000	1.38-005	1.94-005	0.252	0.000
50	4.939-006	0.0498	0.0000	0.00+000	1.15-005	1.65-005	0.252	0.000

All exponential numbers are designated by a sign following the number, then by two zeros and the exponent. Thus, 3.26-003 = 3.26×10^{-3}.

TABLE 5.14. Parameters at 0.70 microns

Alt (km) h	Rayleigh atten. coeff. (km^{-1}) β_r	Rayleigh optical thick. (0-h) τ_r	Rayleigh optical thick. (h-∞) τ'_r	Aerosol atten. coeff. (km^{-1}) β_p	Ozone absorp. coeff. (km^{-1}) β_3	Ext. coeff. (km^{-1}) β_{ext}	Ext. optical thick. (0-h) τ_{ext}	Ext. optical thick. (h-∞) τ'_{ext}
0	4.364-003	0.0000	0.0369	1.35-001	8.19-005	1.39-001	0.000	0.217
1	3.960-003	0.0042	0.0328	5.94-002	7.50-005	6.34-002	0.101	0.115
2	3.586-003	0.0079	0.0290	2.56-002	6.74-005	2.93-002	0.148	0.069
3	3.239-003	0.0113	0.0256	1.08-002	5.75-005	1.41-002	0.170	0.047
4	2.919-003	0.0144	0.0225	4.86-003	5.20-005	7.83-003	0.180	0.036
5	2.623-003	0.0172	0.0197	2.16-003	5.08-005	4.83-003	0.187	0.030
6	2.352-003	0.0197	0.0172	7.42-004	4.97-005	3.14-003	0.191	0.026
7	2.102-003	0.0219	0.0150	2.70-004	5.13-005	2.42-003	0.194	0.023
8	1.873-003	0.0239	0.0130	9.45-005	5.24-005	2.02-003	0.196	0.021
9	1.664-003	0.0257	0.0113	3.37-005	6.46-005	1.76-003	0.198	0.019
10	1.473-003	0.0272	0.0097	1.75-005	8.05-005	1.57-003	0.199	0.018
11	1.300-003	0.0286	0.0083	1.52-005	1.06-004	1.42-003	0.201	0.016
12	1.111-003	0.0298	0.0071	1.48-005	1.43-004	1.27-003	0.202	0.015
13	9.497-004	0.0309	0.0061	1.62-005	1.94-004	1.16-003	0.203	0.013
14	8.117-004	0.0317	0.0052	1.75-005	2.20-004	1.05-003	0.205	0.012
15	6.938-004	0.0325	0.0044	2.84-005	2.29-004	9.51-004	0.206	0.011
16	5.930-004	0.0331	0.0038	4.59-005	2.37-004	8.76-004	0.207	0.010
17	5.069-004	0.0337	0.0032	4.99-005	2.55-004	8.12-004	0.208	0.010
18	4.334-004	0.0342	0.0028	5.40-005	2.81-004	7.68-004	0.209	0.009
19	3.705-004	0.0346	0.0024	6.07-005	3.27-004	7.58-004	0.210	0.008
20	3.167-004	0.0349	0.0020	5.80-005	3.77-004	7.52-004	0.210	0.007
21	2.697-004	0.0352	0.0017	5.53-005	4.23-004	7.48-004	0.211	0.006
22	2.298-004	0.0354	0.0015	5.40-005	4.53-004	7.37-004	0.212	0.005
23	1.959-004	0.0357	0.0013	5.13-005	4.55-004	7.03-004	0.212	0.004
24	1.672-004	0.0358	0.0011	3.51-005	4.44-004	6.46-004	0.213	0.004
25	1.428-004	0.0360	0.0009	2.43-005	4.14-004	5.81-004	0.214	0.003
26	1.220-004	0.0361	0.0008	1.75-005	3.75-004	5.14-004	0.214	0.003
27	1.044-004	0.0362	0.0007	1.62-005	3.24-004	4.45-004	0.215	0.002
28	8.932-005	0.0363	0.0006	1.48-005	2.83-004	3.87-004	0.215	0.002
29	7.650-005	0.0364	0.0005	1.35-005	2.46-004	3.36-004	0.215	0.002
30	6.557-005	0.0365	0.0004	1.28-005	2.08-004	2.86-004	0.215	0.001
31	5.625-005	0.0366	0.0004	0.00+000	1.82-004	2.39-004	0.216	0.001
32	4.828-005	0.0366	0.0003	0.00+000	1.57-004	2.05-004	0.216	0.001
33	4.122-005	0.0366	0.0003	0.00+000	1.34-004	1.75-004	0.216	0.001
34	3.522-005	0.0367	0.0002	0.00+000	1.11-004	1.46-004	0.216	0.001
35	3.015-005	0.0367	0.0002	0.00+000	9.91-005	1.29-004	0.216	0.001
36	2.585-005	0.0367	0.0002	0.00+000	8.30-005	1.09-004	0.216	0.000
37	2.221-005	0.0368	0.0002	0.00+000	6.95-005	9.17-005	0.216	0.000
38	1.912-005	0.0368	0.0001	0.00+000	5.82-005	7.73-005	0.217	0.000
39	1.648-005	0.0368	0.0001	0.00+000	4.99-005	6.64-005	0.217	0.000
40	1.423-005	0.0368	0.0001	0.00+000	4.28-005	5.70-005	0.217	0.000
41	1.231-005	0.0368	0.0001	0.00+000	3.50-005	4.73-005	0.217	0.000
42	1.067-005	0.0368	0.0001	0.00+000	2.74-005	3.80-005	0.217	0.000
43	9.257-006	0.0369	0.0001	0.00+000	2.14-005	3.06-005	0.217	0.000
44	8.046-006	0.0369	0.0001	0.00+000	1.71-005	2.52-005	0.217	0.000
45	7.004-006	0.0369	0.0001	0.00+000	1.32-005	2.03-005	0.217	0.000
46	6.105-006	0.0369	0.0000	0.00+000	1.03-005	1.64-005	0.217	0.000
47	5.330-006	0.0369	0.0000	0.00+000	8.12-006	1.34-005	0.217	0.000
48	4.690-006	0.0369	0.0000	0.00+000	6.42-006	1.11-005	0.217	0.000
49	4.142-006	0.0369	0.0000	0.00+000	5.13-006	9.27-006	0.217	0.000
50	3.658-006	0.0369	0.0000	0.00+000	4.28-006	7.94-006	0.217	0.000

All exponential numbers are designated by a sign following the number, then by two zeros and the exponent. Thus, $3.26\text{-}003 = 3.26 \times 10^{-3}$.

TABLE 5.15. Parameters at 0.80 microns

Alt (km) h	Rayleigh atten. coeff. (km^{-1}) β_r	Rayleigh optical thick. (0-h) τ_r	Rayleigh optical thick. (h-∞) τ'_r	Aerosol atten. coeff. (km^{-1}) β_p	Ozone absorp. coeff. (km^{-1}) β_3	Ext. coeff. (km^{-1}) β_{ext}	Ext. optical thick. (0-h) τ_{ext}	Ext. optical thick. (h-∞) τ'_{ext}
0	2.545-003	0.0000	0.0215	1.27-001	3.56-005	1.30-001	0.000	0.187
1	2.309-003	0.0024	0.0191	5.59-002	3.26-005	5.82-002	0.094	0.093
2	2.091-003	0.0046	0.0169	2.41-002	2.93-005	2.63-002	0.136	0.051
3	1.889-003	0.0066	0.0149	1.02-002	2.50-005	1.21-002	0.155	0.032
4	1.702-003	0.0084	0.0131	4.57-003	2.26-005	6.30-003	0.164	0.022
5	1.530-003	0.0100	0.0115	2.03-003	2.21-005	3.58-003	0.169	0.017
6	1.371-003	0.0115	0.0101	6.98-004	2.16-005	2.09-003	0.172	0.015
7	1.226-003	0.0128	0.0088	2.54-004	2.23-005	1.50-003	0.174	0.013
8	1.092-003	0.0139	0.0076	8.89-005	2.28-005	1.20-003	0.175	0.011
9	9.702-004	0.0150	0.0066	3.17-005	2.81-005	1.03-003	0.177	0.010
10	8.590-004	0.0159	0.0057	1.65-005	3.50-005	9.10-004	0.177	0.009
11	7.578-004	0.0167	0.0048	1.52-005	4.60-005	8.19-004	0.178	0.009
12	6.480-004	0.0174	0.0041	1.40-005	6.21-005	7.24-004	0.179	0.008
13	5.538-004	0.0180	0.0035	1.52-005	8.45-005	6.54-004	0.180	0.007
14	4.733-004	0.0185	0.0030	1.65-005	9.57-005	5.86-004	0.180	0.006
15	4.046-004	0.0189	0.0026	2.67-005	9.94-005	5.31-004	0.181	0.006
16	3.458-004	0.0193	0.0022	4.32-005	1.03-004	4.92-004	0.182	0.005
17	2.956-004	0.0196	0.0019	4.70-005	1.11-004	4.54-004	0.182	0.005
18	2.527-004	0.0199	0.0016	5.08-005	1.22-004	4.26-004	0.182	0.004
19	2.160-004	0.0202	0.0014	5.71-005	1.42-004	4.15-004	0.183	0.004
20	1.847-004	0.0204	0.0012	5.46-005	1.64-004	4.03-004	0.183	0.004
21	1.573-004	0.0205	0.0010	5.21-005	1.84-004	3.93-004	0.184	0.003
22	1.340-004	0.0207	0.0009	5.08-005	1.97-004	3.82-004	0.184	0.003
23	1.142-004	0.0208	0.0007	4.83-005	1.98-004	3.61-004	0.184	0.002
24	9.749-005	0.0209	0.0006	3.30-005	1.93-004	3.24-004	0.185	0.002
25	8.325-005	0.0210	0.0005	2.29-005	1.80-004	2.86-004	0.185	0.002
26	7.115-005	0.0211	0.0005	1.65-005	1.63-004	2.51-004	0.185	0.002
27	6.085-005	0.0211	0.0004	1.52-005	1.41-004	2.17-004	0.186	0.001
28	5.208-005	0.0212	0.0003	1.40-005	1.23-004	1.89-004	0.186	0.001
29	4.461-005	0.0212	0.0003	1.27-005	1.07-004	1.64-004	0.186	0.001
30	3.824-005	0.0213	0.0003	1.21-005	9.03-005	1.41-004	0.186	0.001
31	3.280-005	0.0213	0.0002	0.00+000	7.93-005	1.12-004	0.186	0.001
32	2.815-005	0.0213	0.0002	0.00+000	6.82-005	9.64-005	0.186	0.001
33	2.404-005	0.0214	0.0002	0.00+000	5.82-005	8.22-005	0.186	0.000
34	2.054-005	0.0214	0.0001	0.00+000	4.83-005	6.88-005	0.186	0.000
35	1.758-005	0.0214	0.0001	0.00+000	4.31-005	6.07-005	0.187	0.000
36	1.507-005	0.0214	0.0001	0.00+000	3.61-005	5.12-005	0.187	0.000
37	1.295-005	0.0214	0.0001	0.00+000	3.02-005	4.32-005	0.187	0.000
38	1.115-005	0.0215	0.0001	0.00+000	2.53-005	3.64-005	0.187	0.000
39	9.610-006	0.0215	0.0001	0.00+000	2.17-005	3.13-005	0.187	0.000
40	8.299-006	0.0215	0.0001	0.00+000	1.86-005	2.69-005	0.187	0.000
41	7.179-006	0.0215	0.0001	0.00+000	1.52-005	2.24-005	0.187	0.000
42	6.220-006	0.0215	0.0000	0.00+000	1.19-005	1.81-005	0.187	0.000
43	5.398-006	0.0215	0.0000	0.00+000	9.30-006	1.47-005	0.187	0.000
44	4.692-006	0.0215	0.0000	0.00+000	7.44-006	1.21-005	0.187	0.000
45	4.084-006	0.0215	0.0000	0.00+000	5.76-006	9.84-006	0.187	0.000
46	3.560-006	0.0215	0.0000	0.00+000	4.46-006	8.02-006	0.187	0.000
47	3.108-006	0.0215	0.0000	0.00+000	3.53-006	6.64-006	0.187	0.000
48	2.735-006	0.0215	0.0000	0.00+000	2.79-006	5.52-006	0.187	0.000
49	2.415-006	0.0215	0.0000	0.00+000	2.23-006	4.65-006	0.187	0.000
50	2.133-006	0.0215	0.0000	0.00+000	1.86-006	3.99-006	0.187	0.000

All exponential numbers are designated by a sign following the number, then by two zeros and the exponent. Thus, 3.26-003 = 3.26×10^{-3}.

TABLE 5.16. Parameters at 0.90 microns

Alt (km) h	Rayleigh atten. coeff. (km^{-1}) β_r	Rayleigh optical thick. (0-h) τ_r	Rayleigh optical thick. (h-∞) τ'_r	Aerosol atten. coeff. (km^{-1}) β_p	Ozone absorp. coeff. (km^{-1}) β_3	Ext. coeff. (km^{-1}) β_{ext}	Ext. optical thick. (0-h) τ_{ext}	Ext. optical thick. (h-∞) τ'_{ext}
0	1.583-003	0.0006	0.0134	1.20-001	0.00+000	1.22-001	0.000	0.166
1	1.436-003	0.0015	0.0119	5.28-002	0.00+000	5.42-002	0.088	0.079
2	1.300-003	0.0029	0.0105	2.28-002	0.00+000	2.41-002	0.127	0.039
3	1.175-003	0.0041	0.0093	9.60-003	0.00+000	1.08-002	0.145	0.022
4	1.058-003	0.0052	0.0082	4.32-003	0.00+000	5.38-003	0.153	0.014
5	9.514-004	0.0062	0.0072	1.92-003	0.00+000	2.87-003	0.157	0.010
6	8.528-004	0.0071	0.0063	6.60-004	0.00+000	1.51-003	0.159	0.008
7	7.622-004	0.0079	0.0054	2.40-004	0.00+000	1.00-003	0.160	0.006
8	6.792-004	0.0087	0.0047	8.40-005	0.00+000	7.63-004	0.161	0.005
9	6.034-004	0.0093	0.0041	3.00-005	0.00+000	6.33-004	0.162	0.005
10	5.342-004	0.0099	0.0035	1.56-005	0.00+000	5.50-004	0.162	0.004
11	4.713-004	0.0104	0.0030	1.44-005	0.00+000	4.86-004	0.163	0.004
12	4.030-004	0.0108	0.0026	1.32-005	0.00+000	4.16-004	0.163	0.003
13	3.444-004	0.0112	0.0022	1.44-005	0.00+000	3.59-004	0.164	0.003
14	2.944-004	0.0115	0.0019	1.56-005	0.00+000	3.10-004	0.164	0.002
15	2.516-004	0.0118	0.0016	2.52-005	0.00+000	2.77-004	0.164	0.002
16	2.151-004	0.0120	0.0014	4.08-005	0.00+000	2.56-004	0.165	0.002
17	1.838-004	0.0122	0.0012	4.44-005	0.00+000	2.28-004	0.165	0.002
18	1.572-004	0.0124	0.0010	4.80-005	0.00+000	2.05-004	0.165	0.001
19	1.343-004	0.0125	0.0009	5.40-005	0.00+000	1.88-004	0.165	0.001
20	1.148-004	0.0127	0.0007	5.16-005	0.00+000	1.66-004	0.165	0.001
21	9.780-005	0.0128	0.0006	4.92-005	0.00+000	1.47-004	0.166	0.001
22	8.333-005	0.0129	0.0005	4.80-005	0.00+000	1.31-004	0.166	0.001
23	7.105-005	0.0129	0.0005	4.56-005	0.00+000	1.17-004	0.166	0.001
24	6.063-005	0.0130	0.0004	3.12-005	0.00+000	9.18-005	0.166	0.000
25	5.177-005	0.0131	0.0003	2.16-005	0.00+000	7.34-005	0.166	0.000
26	4.425-005	0.0131	0.0003	1.56-005	0.00+000	5.98-005	0.166	0.000
27	3.784-005	0.0131	0.0003	1.44-005	0.00+000	5.22-005	0.166	0.000
28	3.239-005	0.0132	0.0002	1.32-005	0.00+000	4.56-005	0.166	0.000
29	2.774-005	0.0132	0.0002	1.20-005	0.00+000	3.97-005	0.166	0.000
30	2.378-005	0.0132	0.0002	1.14-005	0.00+000	3.52-005	0.166	0.000
31	2.040-005	0.0133	0.0001	0.00+000	0.00+000	2.04-005	0.166	0.000
32	1.751-005	0.0133	0.0001	0.00+000	0.00+000	1.75-005	0.166	0.000
33	1.495-005	0.0133	0.0001	0.00+000	0.00+000	1.49-005	0.166	0.000
34	1.277-005	0.0133	0.0001	0.00+000	0.00+000	1.28-005	0.166	0.000
35	1.093-005	0.0133	0.0001	0.00+000	0.00+000	1.09-005	0.166	0.000
36	9.375-006	0.0133	0.0001	0.00+000	0.00+000	9.37-006	0.166	0.000
37	8.054-006	0.0133	0.0001	0.00+000	0.00+000	8.05-006	0.166	0.000
38	6.932-006	0.0133	0.0001	0.00+000	0.00+000	6.93-006	0.166	0.000
39	5.976-006	0.0133	0.0000	0.00+000	0.00+000	5.98-006	0.166	0.000
40	5.161-006	0.0134	0.0000	0.00+000	0.00+000	5.16-006	0.166	0.000
41	4.465-006	0.0134	0.0000	0.00+000	0.00+000	4.46-006	0.166	0.000
42	3.868-006	0.0134	0.0000	0.00+000	0.00+000	3.87-006	0.166	0.000
43	3.357-006	0.0134	0.0000	0.00+000	0.00+000	3.36-006	0.166	0.000
44	2.918-006	0.0134	0.0000	0.00+000	0.00+000	2.92-006	0.166	0.000
45	2.540-006	0.0134	0.0000	0.00+000	0.00+000	2.54-006	0.166	0.000
46	2.214-006	0.0134	0.0000	0.00+000	0.00+000	2.21-006	0.166	0.000
47	1.933-006	0.0134	0.0000	0.00+000	0.00+000	1.93-006	0.166	0.000
48	1.701-006	0.0134	0.0000	0.00+000	0.00+000	1.70-006	0.166	0.000
49	1.502-006	0.0134	0.0000	0.00+000	0.00+000	1.50-006	0.166	0.000
50	1.326-006	0.0134	0.0000	0.00+000	0.00+000	1.33-006		

All exponential numbers are designated by a sign following the number, then by two zeros and the exponent. Thus, 3.26-003 = 3.26×10^{-3}.

TABLE 5.17. Parameters at 1.06 microns

Alt (km) h	Rayleigh atten. coeff. (km^{-1}) β_r	Rayleigh optical thick. (0-h) τ_r	Rayleigh optical thick. (h-∞) τ'_r	Aerosol atten. coeff. (km^{-1}) β_p	Ozone absorp. coeff. (km^{-1}) β_3	Ext. coeff. (km^{-1}) β_{ext}	Ext. optical thick. (0-h) τ_{ext}	Ext. optical thick. (h-∞) τ'_{ext}
0	8.456-004	0.0000	0.0072	1.13-001	0.00+000	1.14-001	0.000	0.151
1	7.675-004	0.0008	0.0064	4.97-002	0.00+000	5.05-002	0.082	0.069
2	6.950-004	0.0015	0.0056	2.15-002	0.00+000	2.22-002	0.118	0.033
3	6.278-004	0.0022	0.0050	9.04-003	0.00+000	9.67-003	0.134	0.017
4	5.657-004	0.0028	0.0044	4.07-003	0.00+000	4.63-003	0.142	0.010
5	5.085-004	0.0033	0.0038	1.81-003	0.00+000	2.32-003	0.145	0.006
6	4.558-004	0.0038	0.0033	6.22-004	0.00+000	1.08-003	0.147	0.005
7	4.074-004	0.0042	0.0029	2.26-004	0.00+000	6.33-004	0.148	0.004
8	3.630-004	0.0046	0.0025	7.91-005	0.00+000	4.42-004	0.148	0.003
9	3.225-004	0.0050	0.0022	2.82-005	0.00+000	3.51-004	0.149	0.003
10	2.855-004	0.0053	0.0019	1.47-005	0.00+000	3.00-004	0.149	0.002
11	2.519-004	0.0055	0.0016	1.36-005	0.00+000	2.65-004	0.149	0.002
12	2.154-004	0.0056	0.0014	1.24-005	0.00+000	2.28-004	0.149	0.002
13	1.841-004	0.0060	0.0012	1.36-005	0.00+000	1.98-004	0.150	0.002
14	1.573-004	0.0062	0.0010	1.47-005	0.00+000	1.72-004	0.150	0.002
15	1.345-004	0.0063	0.0009	2.37-005	0.00+000	1.58-004	0.150	0.001
16	1.149-004	0.0064	0.0007	3.84-005	0.00+000	1.53-004	0.150	0.001
17	9.825-005	0.0065	0.0006	4.18-005	0.00+000	1.40-004	0.150	0.001
18	8.399-005	0.0066	0.0005	4.52-005	0.00+000	1.29-004	0.150	0.001
19	7.180-005	0.0067	0.0005	5.08-005	0.00+000	1.23-004	0.151	0.001
20	6.138-005	0.0068	0.0004	4.86-005	0.00+000	1.10-004	0.151	0.001
21	5.227-005	0.0068	0.0003	4.63-005	0.00+000	9.86-005	0.151	0.001
22	4.453-005	0.0069	0.0003	4.52-005	0.00+000	8.97-005	0.151	0.000
23	3.797-005	0.0069	0.0002	4.29-005	0.00+000	8.09-005	0.151	0.000
24	3.240-005	0.0069	0.0002	2.94-005	0.00+000	6.18-005	0.151	0.000
25	2.767-005	0.0070	0.0002	2.03-005	0.00+000	4.80-005	0.151	0.000
26	2.365-005	0.0070	0.0002	1.47-005	0.00+000	3.83-005	0.151	0.000
27	2.023-005	0.0070	0.0001	1.36-005	0.00+000	3.38-005	0.151	0.000
28	1.731-005	0.0070	0.0001	1.24-005	0.00+000	2.97-005	0.151	0.000
29	1.483-005	0.0071	0.0001	1.13-005	0.00+000	2.61-005	0.151	0.000
30	1.271-005	0.0071	0.0001	1.07-005	0.00+000	2.34-005	0.151	0.000
31	1.090-005	0.0071	0.0001	0.00+000	0.00+000	1.09-005	0.151	0.000
32	9.357-006	0.0071	0.0001	0.00+000	0.00+000	9.36-006	0.151	0.000
33	7.989-006	0.0071	0.0001	0.00+000	0.00+000	7.99-006	0.151	0.000
34	6.826-006	0.0071	0.0000	0.00+000	0.00+000	6.83-006	0.151	0.000
35	5.843-006	0.0071	0.0000	0.00+000	0.00+000	5.84-006	0.151	0.000
36	5.010-006	0.0071	0.0000	0.00+000	0.00+000	5.01-006	0.151	0.000
37	4.304-006	0.0071	0.0000	0.00+000	0.00+000	4.30-006	0.151	0.000
38	3.705-006	0.0071	0.0000	0.00+000	0.00+000	3.70-006	0.151	0.000
39	3.194-006	0.0071	0.0000	0.00+000	0.00+000	3.19-006	0.151	0.000
40	2.758-006	0.0071	0.0000	0.00+000	0.00+000	2.76-006	0.151	0.000
41	2.386-006	0.0071	0.0000	0.00+000	0.00+000	2.39-006	0.151	0.000
42	2.067-006	0.0071	0.0000	0.00+000	0.00+000	2.07-006	0.151	0.000
43	1.794-006	0.0071	0.0000	0.00+000	0.00+000	1.79-006	0.151	0.000
44	1.559-006	0.0071	0.0000	0.00+000	0.00+000	1.56-006	0.151	0.000
45	1.357-006	0.0071	0.0000	0.00+000	0.00+000	1.36-006	0.151	0.000
46	1.183-006	0.0071	0.0000	0.00+000	0.00+000	1.18-006	0.151	0.000
47	1.033-006	0.0071	0.0000	0.00+000	0.00+000	1.03-006	0.151	0.000
48	9.089-007	0.0072	0.0000	0.00+000	0.00+000	9.09-007	0.151	0.000
49	8.027-007	0.0072	0.0000	0.00+000	0.00+000	8.03-007	0.151	0.000
50	7.089-007	0.0072	0.0000	0.00+000	0.00+000	7.09-007	0.151	0.000

All exponential numbers are designated by a sign following the number, then by two zeros and the exponent. Thus, 3.26-003 = 3.26×10^{-3}.

TABLE 5.18. Parameters at 1.26 microns

Alt (km)	Rayleigh atten. coeff. (km^{-1})	Rayleigh optical thick. (0-h)	Rayleigh optical thick. ($h-\infty$)	Aerosol atten. coeff. (km^{-1})	Ozone absorp. coeff. (km^{-1})	Ext. coeff. (km^{-1})	Ext. optical thick. (0-h)	Ext. optical thick. ($h-\infty$)
h	β_r	τ_r	τ'_r	β_p	β_3	β_{ext}	τ_{ext}	τ'_{ext}
0	4.076-004	0.0000	0.0034	1.08-001	0.00+000	1.08-001	0.000	0.141
1	3.699-004	0.0004	0.0031	4.75-002	0.00+000	4.79-002	0.078	0.063
2	3.349-004	0.0007	0.0027	2.05-002	0.00+000	2.09-002	0.113	0.029
3	3.025-004	0.0011	0.0024	8.64-003	0.00+000	8.94-003	0.127	0.014
4	2.726-004	0.0013	0.0021	3.89-003	0.00+000	4.16-003	0.134	0.007
5	2.450-004	0.0016	0.0018	1.73-003	0.00+000	1.97-003	0.137	0.004
6	2.196-004	0.0018	0.0016	5.94-004	0.00+000	8.14-004	0.138	0.003
7	1.963-004	0.0020	0.0014	2.16-004	0.00+000	4.12-004	0.139	0.002
8	1.749-004	0.0022	0.0012	7.56-005	0.00+000	2.51-004	0.139	0.002
9	1.554-004	0.0024	0.0011	2.70-005	0.00+000	1.82-004	0.140	0.002
10	1.376-004	0.0025	0.0009	1.40-005	0.00+000	1.52-004	0.140	0.001
11	1.214-004	0.0027	0.0008	1.30-005	0.00+000	1.34-004	0.140	0.001
12	1.038-004	0.0028	0.0007	1.19-005	0.00+000	1.16-004	0.140	0.001
13	8.871-005	0.0029	0.0006	1.30-005	0.00+000	1.02-004	0.140	0.001
14	7.582-005	0.0030	0.0005	1.40-005	0.00+000	8.99-005	0.140	0.001
15	6.480-005	0.0030	0.0004	2.27-005	0.00+000	8.75-005	0.140	0.001
16	5.539-005	0.0031	0.0004	3.67-005	0.00+000	9.21-005	0.140	0.001
17	4.735-005	0.0031	0.0003	4.00-005	0.00+000	8.73-005	0.141	0.001
18	4.048-005	0.0032	0.0003	4.32-005	0.00+000	8.37-005	0.141	0.001
19	3.460-005	0.0032	0.0002	4.86-005	0.00+000	8.32-005	0.141	0.001
20	2.958-005	0.0033	0.0002	4.64-005	0.00+000	7.60-005	0.141	0.000
21	2.519-005	0.0033	0.0002	4.43-005	0.00+000	6.95-005	0.141	0.000
22	2.146-005	0.0033	0.0001	4.32-005	0.00+000	6.47-005	0.141	0.000
23	1.830-005	0.0033	0.0001	4.10-005	0.00+000	5.93-005	0.141	0.000
24	1.562-005	0.0033	0.0001	2.81-005	0.00+000	4.37-005	0.141	0.000
25	1.334-005	0.0034	0.0001	1.94-005	0.00+000	3.28-005	0.141	0.000
26	1.140-005	0.0034	0.0001	1.40-005	0.00+000	2.54-005	0.141	0.000
27	9.747-006	0.0034	0.0001	1.30-005	0.00+000	2.27-005	0.141	0.000
28	8.343-006	0.0034	0.0001	1.19-005	0.00+000	2.02-005	0.141	0.000
29	7.146-006	0.0034	0.0000	1.08-005	0.00+000	1.79-005	0.141	0.000
30	6.125-006	0.0034	0.0000	1.03-005	0.00+000	1.64-005	0.141	0.000
31	5.254-006	0.0034	0.0000	0.00+000	0.00+000	5.25-006	0.141	0.000
32	4.510-006	0.0034	0.0000	0.00+000	0.00+000	4.51-006	0.141	0.000
33	3.850-006	0.0034	0.0000	0.00+000	0.00+000	3.85-006	0.141	0.000
34	3.289-006	0.0034	0.0000	0.00+000	0.00+000	3.29-006	0.141	0.000
35	2.816-006	0.0034	0.0000	0.00+000	0.00+000	2.82-006	0.141	0.000
36	2.415-006	0.0034	0.0000	0.00+000	0.00+000	2.41-006	0.141	0.000
37	2.074-006	0.0034	0.0000	0.00+000	0.00+000	2.07-006	0.141	0.000
38	1.785-006	0.0034	0.0000	0.00+000	0.00+000	1.79-006	0.141	0.000
39	1.539-006	0.0034	0.0000	0.00+000	0.00+000	1.54-006	0.141	0.000
40	1.329-006	0.0034	0.0000	0.00+000	0.00+000	1.33-006	0.141	0.000
41	1.150-006	0.0034	0.0000	0.00+000	0.00+000	1.15-006	0.141	0.000
42	9.963-007	0.0034	0.0000	0.00+000	0.00+000	9.96-007	0.141	0.000
43	8.646-007	0.0034	0.0000	0.00+000	0.00+000	8.65-007	0.141	0.000
44	7.515-007	0.0034	0.0000	0.00+000	0.00+000	7.51-007	0.141	0.000
45	6.542-007	0.0034	0.0000	0.00+000	0.00+000	6.54-007	0.141	0.000
46	5.703-007	0.0034	0.0000	0.00+000	0.00+000	5.70-007	0.141	0.000
47	4.979-007	0.0034	0.0000	0.00+000	0.00+000	4.98-007	0.141	0.000
48	4.380-007	0.0034	0.0000	0.00+000	0.00+000	4.38-007	0.141	0.000
49	3.868-007	0.0034	0.0000	0.00+000	0.00+000	3.87-007	0.141	0.000
50	3.416-007	0.0034	0.0000	0.00+000	0.00+000	3.42-007	0.141	0.000

All exponential numbers are designated by a sign following the number, then by two zeros and the exponent. Thus, $3.26\text{-}003 = 3.26 \times 10^{-3}$.

TABLE 5.19. Parameters at 1.67 microns

Alt (km) h	Rayleigh atten. coeff. (km^{-1}) β_r	Rayleigh optical thick. (0-h) τ_r	Rayleigh optical thick. (h-∞) τ'_r	Aerosol atten. coeff. (km^{-1}) β_p	Ozone absorp. coeff. (km^{-1}) β_3	Ext. coeff. (km^{-1}) β_{ext}	Ext. optical thick. (0-h) τ_{ext}	Ext. optical thick. (h-∞) τ'_{ext}
0	1.327-004	0.0000	0.0011	9.80-002	0.00+000	9.81-002	0.000	0.126
1	1.204-004	0.0001	0.0010	4.31-002	0.00+000	4.32-002	0.071	0.055
2	1.091-004	0.0002	0.0009	1.86-002	0.00+000	1.87-002	0.102	0.024
3	9.852-005	0.0003	0.0008	7.84-003	0.00+000	7.94-003	0.115	0.011
4	8.877-005	0.0004	0.0007	3.53-003	0.00+000	3.62-003	0.121	0.005
5	7.979-005	0.0005	0.0006	1.57-003	0.00+000	1.65-003	0.123	0.003
6	7.152-005	0.0006	0.0005	5.39-004	0.00+000	6.11-004	0.125	0.002
7	6.393-005	0.0007	0.0005	1.96-004	0.00+000	2.60-004	0.125	0.001
8	5.697-005	0.0007	0.0004	6.86-005	0.00+000	1.26-004	0.125	0.001
9	5.060-005	0.0008	0.0003	2.45-005	0.00+000	7.51-005	0.125	0.001
10	4.480-005	0.0008	0.0003	1.27-005	0.00+000	5.75-005	0.125	0.001
11	3.953-005	0.0009	0.0003	1.18-005	0.00+000	5.13-005	0.125	0.001
12	3.380-005	0.0009	0.0002	1.08-005	0.00+000	4.46-005	0.125	0.001
13	2.888-005	0.0009	0.0002	1.18-005	0.00+000	4.06-005	0.125	0.001
14	2.469-005	0.0010	0.0002	1.27-005	0.00+000	3.74-005	0.125	0.001
15	2.110-005	0.0010	0.0001	2.06-005	0.00+000	4.17-005	0.126	0.001
16	1.804-005	0.0010	0.0001	3.33-005	0.00+000	5.14-005	0.126	0.001
17	1.542-005	0.0010	0.0001	3.63-005	0.00+000	5.17-005	0.126	0.001
18	1.318-005	0.0010	0.0001	3.92-005	0.00+000	5.24-005	0.126	0.000
19	1.127-005	0.0011	0.0001	4.41-005	0.00+000	5.54-005	0.126	0.000
20	9.632-006	0.0011	0.0001	4.21-005	0.00+000	5.18-005	0.126	0.000
21	8.202-006	0.0011	0.0001	4.02-005	0.00+000	4.84-005	0.126	0.000
22	6.989-006	0.0011	0.0000	3.92-005	0.00+000	4.62-005	0.126	0.000
23	5.959-006	0.0011	0.0000	3.72-005	0.00+000	4.32-005	0.126	0.000
24	5.085-006	0.0011	0.0000	2.55-005	0.00+000	3.06-005	0.126	0.000
25	4.342-006	0.0011	0.0000	1.76-005	0.00+000	2.20-005	0.126	0.000
26	3.711-006	0.0011	0.0000	1.27-005	0.00+000	1.65-005	0.126	0.000
27	3.174-006	0.0011	0.0000	1.18-005	0.00+000	1.49-005	0.126	0.000
28	2.717-006	0.0011	0.0000	1.08-005	0.00+000	1.35-005	0.126	0.000
29	2.327-006	0.0011	0.0000	9.80-006	0.00+000	1.21-005	0.126	0.000
30	1.994-006	0.0011	0.0000	9.31-006	0.00+000	1.13-005	0.126	0.000
31	1.711-006	0.0011	0.0000	0.00+000	0.00+000	1.71-006	0.126	0.000
32	1.468-006	0.0011	0.0000	0.00+000	0.00+000	1.47-006	0.126	0.000
33	1.254-006	0.0011	0.0000	0.00+000	0.00+000	1.25-006	0.126	0.000
34	1.071-006	0.0011	0.0000	0.00+000	0.00+000	1.07-006	0.126	0.000
35	9.169-007	0.0011	0.0000	0.00+000	0.00+000	9.17-007	0.126	0.000
36	7.862-007	0.0011	0.0000	0.00+000	0.00+000	7.86-007	0.126	0.000
37	6.755-007	0.0011	0.0000	0.00+000	0.00+000	6.75-007	0.126	0.000
38	5.814-007	0.0011	0.0000	0.00+000	0.00+000	5.81-007	0.126	0.000
39	5.012-007	0.0011	0.0000	0.00+000	0.00+000	5.01-007	0.126	0.000
40	4.329-007	0.0011	0.0000	0.00+000	0.00+000	4.33-007	0.126	0.000
41	3.744-007	0.0011	0.0000	0.00+000	0.00+000	3.74-007	0.126	0.000
42	3.244-007	0.0011	0.0000	0.00+000	0.00+000	3.24-007	0.126	0.000
43	2.815-007	0.0011	0.0000	0.00+000	0.00+000	2.82-007	0.126	0.000
44	2.447-007	0.0011	0.0000	0.00+000	0.00+000	2.45-007	0.126	0.000
45	2.130-007	0.0011	0.0000	0.00+000	0.00+000	2.13-007	0.126	0.000
46	1.857-007	0.0011	0.0000	0.00+000	0.00+000	1.86-007	0.126	0.000
47	1.621-007	0.0011	0.0000	0.00+000	0.00+000	1.62-007	0.126	0.000
48	1.426-007	0.0011	0.0000	0.00+000	0.00+000	1.43-007	0.126	0.000
49	1.260-007	0.0011	0.0000	0.00+000	0.00+000	1.26-007	0.126	0.000
50	1.112-007	0.0011	0.0000	0.00+000	0.00+000	1.11-007	0.126	0.000

All exponential numbers are designated by a sign following the number, then by two zeros and the exponent. Thus, 3.26-003 = 3.26×10^{-3}.

TABLE 5.20. Parameters at 2.17 microns

Alt (km)	Rayleigh atten. coeff. (km^{-1})	Rayleigh optical thick. (0-h)	Rayleigh optical thick. (h-∞)	Aerosol atten. coeff. (km^{-1})	Ozone absorp. coeff. (km^{-1})	Ext. coeff. (km^{-1})	Ext. optical thick. (0-h)	Ext. optical thick. (h-∞)
h	β_r	τ_r	τ'_r	β_p	β_3	β_{ext}	τ_{ext}	τ'_{ext}
0	4.586-005	0.0000	0.0004	8.50-002	0.00+000	8.50-002	0.000	0.109
1	4.161-005	0.0000	0.0003	3.74-002	0.00+000	3.74-002	0.061	0.048
2	3.768-005	0.0001	0.0003	1.62-002	0.00+000	1.62-002	0.088	0.021
3	3.404-005	0.0001	0.0003	6.80-003	0.00+000	6.83-003	0.100	0.009
4	3.067-005	0.0002	0.0002	3.06-003	0.00+000	3.09-003	0.105	0.004
5	2.757-005	0.0002	0.0002	1.36-003	0.00+000	1.39-003	0.107	0.002
6	2.471-005	0.0002	0.0002	4.67-004	0.00+000	4.92-004	0.108	0.001
7	2.209-005	0.0002	0.0002	1.70-004	0.00+000	1.92-004	0.108	0.001
8	1.968-005	0.0003	0.0001	5.95-005	0.00+000	7.92-005	0.108	0.001
9	1.748-005	0.0003	0.0001	2.13-005	0.00+000	3.87-005	0.108	0.001
10	1.548-005	0.0003	0.0001	1.10-005	0.00+000	2.65-005	0.108	0.001
11	1.366-005	0.0003	0.0001	1.02-005	0.00+000	2.39-005	0.108	0.000
12	1.168-005	0.0003	0.0001	9.35-006	0.00+000	2.10-005	0.108	0.000
13	9.979-006	0.0003	0.0001	1.02-005	0.00+000	2.02-005	0.108	0.000
14	8.529-006	0.0003	0.0001	1.10-005	0.00+000	1.96-005	0.108	0.000
15	7.290-006	0.0003	0.0000	1.79-005	0.00+000	2.51-005	0.108	0.000
16	6.231-006	0.0003	0.0000	2.89-005	0.00+000	3.51-005	0.108	0.000
17	5.327-006	0.0004	0.0000	3.14-005	0.00+000	3.68-005	0.108	0.000
18	4.554-006	0.0004	0.0000	3.40-005	0.00+000	3.86-005	0.108	0.000
19	3.893-006	0.0004	0.0000	3.82-005	0.00+000	4.21-005	0.109	0.000
20	3.328-006	0.0004	0.0000	3.65-005	0.00+000	3.99-005	0.109	0.000
21	2.834-006	0.0004	0.0000	3.48-005	0.00+000	3.77-005	0.109	0.000
22	2.415-006	0.0004	0.0000	3.40-005	0.00+000	3.64-005	0.109	0.000
23	2.059-006	0.0004	0.0000	3.23-005	0.00+000	3.44-005	0.109	0.000
24	1.757-006	0.0004	0.0000	2.21-005	0.00+000	2.39-005	0.109	0.000
25	1.500-006	0.0004	0.0000	1.53-005	0.00+000	1.68-005	0.109	0.000
26	1.282-006	0.0004	0.0000	1.10-005	0.00+000	1.23-005	0.109	0.000
27	1.097-006	0.0004	0.0000	1.02-005	0.00+000	1.13-005	0.109	0.000
28	9.385-007	0.0004	0.0000	9.35-006	0.00+000	1.03-005	0.109	0.000
29	8.039-007	0.0004	0.0000	8.50-006	0.00+000	9.30-006	0.109	0.000
30	6.890-007	0.0004	0.0000	8.07-006	0.00+000	8.76-006	0.109	0.000
31	5.910-007	0.0004	0.0000	0.00+000	0.00+000	5.91-007	0.109	0.000
32	5.073-007	0.0004	0.0000	0.00+000	0.00+000	5.07-007	0.109	0.000
33	4.332-007	0.0004	0.0000	0.00+000	0.00+000	4.33-007	0.109	0.000
34	3.701-007	0.0004	0.0000	0.00+000	0.00+000	3.70-007	0.109	0.000
35	3.168-007	0.0004	0.0000	0.00+000	0.00+000	3.17-007	0.109	0.000
36	2.716-007	0.0004	0.0000	0.00+000	0.00+000	2.72-007	0.109	0.000
37	2.334-007	0.0004	0.0000	0.00+000	0.00+000	2.33-007	0.109	0.000
38	2.009-007	0.0004	0.0000	0.00+000	0.00+000	2.01-007	0.109	0.000
39	1.732-007	0.0004	0.0000	0.00+000	0.00+000	1.73-007	0.109	0.000
40	1.495-007	0.0004	0.0000	0.00+000	0.00+000	1.50-007	0.109	0.000
41	1.294-007	0.0004	0.0000	0.00+000	0.00+000	1.29-007	0.109	0.000
42	1.121-007	0.0004	0.0000	0.00+000	0.00+000	1.12-007	0.109	0.000
43	9.727-008	0.0004	0.0000	0.00+000	0.00+000	9.73-008	0.109	0.000
44	8.454-008	0.0004	0.0000	0.00+000	0.00+000	8.45-008	0.109	0.000
45	7.359-008	0.0004	0.0000	0.00+000	0.00+000	7.36-008	0.109	0.000
46	6.416-008	0.0004	0.0000	0.00+000	0.00+000	6.42-008	0.109	0.000
47	5.601-008	0.0004	0.0000	0.00+000	0.00+000	5.60-008	0.109	0.000
48	4.928-008	0.0004	0.0000	0.00+000	0.00+000	4.93-008	0.109	0.000
49	4.352-008	0.0004	0.0000	0.00+000	0.00+000	4.35-008	0.109	0.000
50	3.843-008	0.0004	0.0000	0.00+000	0.00+000	3.84-008	0.109	0.000

All exponential numbers are designated by a sign following the number, then by two zeros and the exponent. Thus, 3.26-003 = 3.26×10^{-3}.

TABLE 5.21. Parameters at 3.50 microns

Alt (km) h	Rayleigh atten. coeff. (km^{-1}) β_r	Rayleigh optical thick. (0-h) τ_r	Rayleigh optical thick. (h-∞) τ'_r	Aerosol atten. coeff. (km^{-1}) β_p	Ozone absorp. coeff. (km^{-1}) β_3	Ext. coeff. (km^{-1}) β_{ext}	Ext. optical thick. (0-h) τ_{ext}	Ext. optical thick. (h-∞) τ'_{ext}
0	6.830-006	0.0000	0.0001	7.00-002	0.00+000	7.00-002	0.000	0.089
1	6.198-006	0.0000	0.0001	3.08-002	0.00+000	3.08-002	0.050	0.039
2	5.612-006	0.0000	0.0000	1.33-002	0.00+000	1.33-002	0.072	0.017
3	5.070-006	0.0000	0.0000	5.60-003	0.00+000	5.61-003	0.082	0.007
4	4.568-006	0.0000	0.0000	2.52-003	0.00+000	2.52-003	0.086	0.003
5	4.106-006	0.0000	0.0000	1.12-003	0.00+000	1.12-003	0.088	0.002
6	3.680-006	0.0000	0.0000	3.85-004	0.00+000	3.89-004	0.089	0.001
7	3.290-006	0.0000	0.0000	1.40-004	0.00+000	1.43-004	0.089	0.001
8	2.931-006	0.0000	0.0000	4.90-005	0.00+000	5.19-005	0.089	0.000
9	2.604-006	0.0000	0.0000	1.75-005	0.00+000	2.01-005	0.089	0.000
10	2.305-006	0.0000	0.0000	9.10-006	0.00+000	1.14-005	0.089	0.000
11	2.034-006	0.0000	0.0000	8.40-006	0.00+000	1.04-005	0.089	0.000
12	1.739-006	0.0000	0.0000	7.70-006	0.00+000	9.44-006	0.089	0.000
13	1.486-006	0.0000	0.0000	8.40-006	0.00+000	9.89-006	0.089	0.000
14	1.270-006	0.0000	0.0000	9.10-006	0.00+000	1.04-005	0.089	0.000
15	1.086-006	0.0001	0.0000	1.47-005	0.00+000	1.58-005	0.089	0.000
16	9.281-007	0.0001	0.0000	2.38-005	0.00+000	2.47-005	0.089	0.000
17	7.934-007	0.0001	0.0000	2.59-005	0.00+000	2.67-005	0.089	0.000
18	6.782-007	0.0001	0.0000	2.80-005	0.00+000	2.87-005	0.089	0.000
19	5.798-007	0.0001	0.0000	3.15-005	0.00+000	3.21-005	0.089	0.000
20	4.956-007	0.0001	0.0000	3.01-005	0.00+000	3.06-005	0.089	0.000
21	4.221-007	0.0001	0.0000	2.87-005	0.00+000	2.91-005	0.089	0.000
22	3.596-007	0.0001	0.0000	2.80-005	0.00+000	2.84-005	0.089	0.000
23	3.066-007	0.0001	0.0000	2.66-005	0.00+000	2.69-005	0.089	0.000
24	2.617-007	0.0001	0.0000	1.82-005	0.00+000	1.85-005	0.089	0.000
25	2.235-007	0.0001	0.0000	1.26-005	0.00+000	1.28-005	0.089	0.000
26	1.910-007	0.0001	0.0000	9.10-006	0.00+000	9.29-006	0.089	0.000
27	1.633-007	0.0001	0.0000	8.40-006	0.00+000	8.56-006	0.089	0.000
28	1.398-007	0.0001	0.0000	7.70-006	0.00+000	7.84-006	0.089	0.000
29	1.197-007	0.0001	0.0000	7.00-006	0.00+000	7.12-006	0.089	0.000
30	1.026-007	0.0001	0.0000	6.65-006	0.00+000	6.75-006	0.089	0.000
31	8.803-008	0.0001	0.0000	0.00+000	0.00+000	8.80-008	0.089	0.000
32	7.556-008	0.0001	0.0000	0.00+000	0.00+000	7.56-008	0.089	0.000
33	6.452-008	0.0001	0.0000	0.00+000	0.00+000	6.45-008	0.089	0.000
34	5.512-008	0.0001	0.0000	0.00+000	0.00+000	5.51-008	0.089	0.000
35	4.718-008	0.0001	0.0000	0.00+000	0.00+000	4.72-008	0.089	0.000
36	4.046-008	0.0001	0.0000	0.00+000	0.00+000	4.05-008	0.089	0.000
37	3.476-008	0.0001	0.0000	0.00+000	0.00+000	3.48-008	0.089	0.000
38	2.992-008	0.0001	0.0000	0.00+000	0.00+000	2.99-008	0.089	0.000
39	2.579-008	0.0001	0.0000	0.00+000	0.00+000	2.58-008	0.089	0.000
40	2.227-008	0.0001	0.0000	0.00+000	0.00+000	2.23-008	0.089	0.000
41	1.927-008	0.0001	0.0000	0.00+000	0.00+000	1.93-008	0.089	0.000
42	1.669-008	0.0001	0.0000	0.00+000	0.00+000	1.67-008	0.089	0.000
43	1.449-008	0.0001	0.0000	0.00+000	0.00+000	1.45-008	0.089	0.000
44	1.259-008	0.0001	0.0000	0.00+000	0.00+000	1.26-008	0.089	0.000
45	1.096-008	0.0001	0.0000	0.00+000	0.00+000	1.10-008	0.089	0.000
46	9.556-009	0.0001	0.0000	0.00+000	0.00+000	9.56-009	0.089	0.000
47	8.342-009	0.0001	0.0000	0.00+000	0.00+000	8.34-009	0.089	0.000
48	7.340-009	0.0001	0.0000	0.00+000	0.00+000	7.34-009	0.089	0.000
49	6.482-009	0.0001	0.0000	0.00+000	0.00+000	6.48-009	0.089	0.000
50	5.724-009	0.0001	0.0000	0.00+000	0.00+000	5.72-009	0.089	0.000

All exponential numbers are designated by a sign following the number, then by two zeros and the exponent. Thus, 3.26-003 = 3.26×10^{-3}.

TABLE 5.22. Parameters at 4.00 microns

Alt (km) h	Rayleigh atten. coeff. (km^{-1}) β_r	Rayleigh optical thick. (0-h) τ_r	Rayleigh optical thick. (h-∞) τ'_r	Aerosol atten. coeff. (km^{-1}) β_p	Ozone absorp. coeff. (km^{-1}) β_3	Ext. coeff. (km^{-1}) β_{ext}	Ext. optical thick. (0-h) τ_{ext}	Ext. optical thick. (h-∞) τ'_{ext}
0	4.002-006	0.0000	0.0000	6.30-002	0.00+000	6.30-002	0.000	0.080
1	3.632-006	0.0000	0.0000	2.77-002	0.00+000	2.77-002	0.045	0.035
2	3.289-006	0.0000	0.0000	1.20-002	0.00+000	1.20-002	0.065	0.015
3	2.971-006	0.0000	0.0000	5.04-003	0.00+000	5.04-003	0.074	0.007
4	2.677-006	0.0000	0.0000	2.27-003	0.00+000	2.27-003	0.077	0.003
5	2.406-006	0.0000	0.0000	1.01-003	0.00+000	1.01-003	0.079	0.001
6	2.157-006	0.0000	0.0000	3.46-004	0.00+000	3.49-004	0.080	0.001
7	1.928-006	0.0000	0.0000	1.26-004	0.00+000	1.28-004	0.080	0.000
8	1.718-006	0.0000	0.0000	4.41-005	0.00+000	4.58-005	0.080	0.000
9	1.526-006	0.0000	0.0000	1.57-005	0.00+000	1.73-005	0.080	0.000
10	1.351-006	0.0000	0.0000	8.19-006	0.00+000	9.54-006	0.080	0.000
11	1.192-006	0.0000	0.0000	7.56-006	0.00+000	8.75-006	0.080	0.000
12	1.019-006	0.0000	0.0000	6.93-006	0.00+000	7.95-006	0.080	0.000
13	8.710-007	0.0000	0.0000	7.56-006	0.00+000	8.43-006	0.080	0.000
14	7.444-007	0.0000	0.0000	8.19-006	0.00+000	8.93-006	0.080	0.000
15	6.363-007	0.0000	0.0000	1.32-005	0.00+000	1.39-005	0.080	0.000
16	5.439-007	0.0000	0.0000	2.14-005	0.00+000	2.20-005	0.080	0.000
17	4.649-007	0.0000	0.0000	2.33-005	0.00+000	2.38-005	0.080	0.000
18	3.974-007	0.0000	0.0000	2.52-005	0.00+000	2.56-005	0.080	0.000
19	3.398-007	0.0000	0.0000	2.84-005	0.00+000	2.87-005	0.080	0.000
20	2.904-007	0.0000	0.0000	2.71-005	0.00+000	2.74-005	0.080	0.000
21	2.473-007	0.0000	0.0000	2.58-005	0.00+000	2.61-005	0.080	0.000
22	2.107-007	0.0000	0.0000	2.52-005	0.00+000	2.54-005	0.080	0.000
23	1.797-007	0.0000	0.0000	2.39-005	0.00+000	2.41-005	0.080	0.000
24	1.533-007	0.0000	0.0000	1.64-005	0.00+000	1.65-005	0.080	0.000
25	1.309-007	0.0000	0.0000	1.13-005	0.00+000	1.15-005	0.080	0.000
26	1.119-007	0.0000	0.0000	8.19-006	0.00+000	8.30-006	0.080	0.000
27	9.571-008	0.0000	0.0000	7.56-006	0.00+000	7.66-006	0.080	0.000
28	8.191-008	0.0000	0.0000	6.93-006	0.00+000	7.01-006	0.080	0.000
29	7.016-008	0.0000	0.0000	6.30-006	0.00+000	6.37-006	0.080	0.000
30	6.014-008	0.0000	0.0000	5.98-006	0.00+000	6.05-006	0.080	0.000
31	5.158-008	0.0000	0.0000	0.00+000	0.00+000	5.16-008	0.080	0.000
32	4.428-008	0.0000	0.0000	0.00+000	0.00+000	4.43-008	0.080	0.000
33	3.780-008	0.0000	0.0000	0.00+000	0.00+000	3.78-008	0.080	0.000
34	3.230-008	0.0000	0.0000	0.00+000	0.00+000	3.23-008	0.080	0.000
35	2.765-008	0.0000	0.0000	0.00+000	0.00+000	2.76-008	0.080	0.000
36	2.371-008	0.0000	0.0000	0.00+000	0.00+000	2.37-008	0.080	0.000
37	2.037-008	0.0000	0.0000	0.00+000	0.00+000	2.04-008	0.080	0.000
38	1.753-008	0.0000	0.0000	0.00+000	0.00+000	1.75-008	0.080	0.000
39	1.511-008	0.0000	0.0000	0.00+000	0.00+000	1.51-008	0.080	0.000
40	1.305-008	0.0000	0.0000	0.00+000	0.00+000	1.31-008	0.080	0.000
41	1.129-008	0.0000	0.0000	0.00+000	0.00+000	1.13-008	0.080	0.000
42	9.783-009	0.0000	0.0000	0.00+000	0.00+000	9.78-009	0.080	0.000
43	8.490-009	0.0000	0.0000	0.00+000	0.00+000	8.49-009	0.080	0.000
44	7.379-009	0.0000	0.0000	0.00+000	0.00+000	7.38-009	0.080	0.000
45	6.423-009	0.0000	0.0000	0.00+000	0.00+000	6.42-009	0.080	0.000
46	5.599-009	0.0000	0.0000	0.00+000	0.00+000	5.60-009	0.080	0.000
47	4.888-009	0.0000	0.0000	0.00+000	0.00+000	4.89-009	0.080	0.000
48	4.301-009	0.0000	0.0000	0.00+000	0.00+000	4.30-009	0.080	0.000
49	3.798-009	0.0000	0.0000	0.00+000	0.00+000	3.80-009	0.080	0.000
50	3.354-009	0.0000	0.0000	0.00+000	0.00+000	3.35-009	0.080	0.000

All exponential numbers are designated by a sign following the number, then by two zeros and the exponent. Thus, $3.26\text{-}003 = 3.26 \times 10^{-3}$.

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